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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

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DISEASES CAUSED BY BACTERIA AND FUNGI

ANON. (1943.) **The limitation or control of the spread of mastitis in dairy herds. (Prepared by the Mastitis Investigation Committee for the Australian Cattle Research Association.)**—*J. Dep. Agric. Vict.* **41.** 15–18. **1011**

A discussion of the measures recommended for the control of mastitis. The value of efficient milking, good hygiene and management is stressed.—J. D. STEEL.

FIELD, H. I., & SMITH, H. W. (1945.) **The coagulase test for staphylococci.**—*J. comp. Path.* **55.** 63–69. **1012**

The authors used the rapid slide coagulase test on 124 strains of staphylococci from cows' udders. Haemolytic strains were classed as pathogenic, and non-haemolytic strains as non-pathogenic. Using fibrinogen instead of plasma, they found that all pathogenic strains were coagulase-positive and all non-pathogenic strains coagulase-negative. When bovine plasma was used, some non-pathogenic strains clumped on the slide, but this was attributed to agglutinins in the plasma; fibrinogen is to be preferred for accurate work.

Using staphylococcus strains isolated from food, human beings, cattle, sheep, dogs, horses, rabbits and geese, they investigated the suitability for test of several types of plasma. Human, bovine, mouse, rabbit or cat plasma can be used for the slide test. Dog, pig, horse, sheep or g. pig plasma was found to be unreliable.
—R. M. LOOSMORE.

CHAPMAN, G. H. (1945.) **The significance of sodium chloride in studies of staphylococci.**—*J. Bact.* **50.** 201–203. [Author's conclusions copied *verbatim.*] **1013**

The addition of a concentration of 7·5 per cent NaCl to solid culture media effectively inhibits most bacteria other than staphylococci. Pathogenic cultures of staphylococci grow luxuriantly, whereas nonpathogenic staphylococci grow poorly.

The addition of 75 grams of NaCl to 1 liter of bacto phenol red mannitol agar provides an improved isolation medium for plasma-coagulating staphylococci.

The addition of 75 grams of NaCl to 1 liter of proteose lactose agar provides an excellent medium for stock cultures of staphylococci. It inhibits contaminating bacteria, enhances chromogenesis and power to coagulate plasma, and reduces the dissociative ("degenerative") tendency.

CHRISTIE, R., GRAYDON, J. J., & WOODS, E. F. (1945.) **Staphylococcal fibrinolysin.**—*Aust. J. exp. Biol. med. Sci.* **23.** 127–130. **1014**

Some pathogenic strains of staphylococci have the ability to lyse fibrin clot. A method is described for detecting and titrating staphylococcal fibrinolysin in broth cultures. Antifibrinolysin can be detected in human serum and in the sera of immunized horses. Most pathogenic animal strains of staphylococci are nonfibrinolytic.—J. T. HAYSTON.

CHRISTIE, R., ATKINS, N. E., & MUNCH-PETERSEN, E. (1944.) **A note on a lytic phenomenon shown by Group B streptococci.**—*Aust. J. exp. Biol. med. Sci.* **22.** 197–200. **1015**

Strains of Group B streptococci (*Streptococcus agalactiae*) produce an agent which will lyse sheep red cells when these cells have been altered by staphylococcal β toxin. The lytic phenomenon is seen wherever the streptococcal colonies grow within the zones of dark surrounding colonies of staphylococci of the $\alpha\beta$ type. The agent, which is extracellular, filtrable and thermostable, will lyse sheep and ox, but not human, horse, rabbit, or g. pig red cells.

Streptococci belonging to groups other than Group B have not been found to produce this agent and it is suggested that the phenomenon may provide a relatively simple confirmatory or substitute test for Group B streptococci.—J. T. HAYSTON.

BAZELEY, P. L. (1942.) **Studies with equine streptococci, 3. Vaccination against strangles.**—*Aust. vet. J.* **18.** 141–155. [For part 2, see *V. B.* **12.** 3.] **1016**

Two field trials were carried out to test the immunizing properties of five differently prepared vaccines against strangles in army horses. The technique of preparing the vaccines is described. One strain of *Str. equi* was used to prepare all the vaccines.

The most suitable site for injecting the vaccines was subcutaneously at the centre of the flat portion of the neck. After vaccination, a hot, oedematous swelling developed, but the severity of the reaction was not considered to be a serious problem. The vaccine was given in two doses, the first, 5 ml., being followed 14 days later by 10 ml. injected about 3 in. from the centre of the first vaccination site.

Provision was made to avoid confusion with nasal catarrh by setting up definite criteria for a diagnosis of strangles.

The results of the first trial were inconclusive. The second trial indicated that a cautiously heat-killed young culture vaccine possessed definite immunizing properties.—J. D. STEEL.

DEVLIN, L. W. (1943.) **The advent of vaccination of stock against anthrax in Australia; with some of the early history of anthrax in the Riverina district of New South Wales.**—*Aust. vet. J.* **19.** 102–111. **1017**

This paper is of historical interest and discusses the part played by D.'s father in introducing Pasteur's method of anthrax vaccination into Australia. Three large properties in the Riverina district, of which D. had personal knowledge, carried about 220,000 sheep,

4,000 cattle and 500 horses. The losses from anthrax on these properties in 1885 were 42,000 sheep, 500 cattle and 60 horses, and in 1886 were 25,000 sheep, 150 cattle and 20 horses. D. states that he has not seen such heavy losses recorded elsewhere.—J. D. STEEL.

STEWART, J. D. (1943.) **The advent of vaccination against anthrax in Australia. [Correspondence.]**—*Aust. vet. J.* **19.** 148–149. **1018**

S. traces the history of preventive vaccination against anthrax in Australia and describes early outbreaks of the disease, the first being recorded in 1851. The Pasteur method of vaccination was first used but fell into disrepute because of the necessity for handling sheep twice and because some unsuccessful vaccinations were reported. Through the collaboration of Messrs. Gunn and McGarvie Smith a reliable one-inoculation attenuated vaccine was elaborated which ousted the Pasteur product from the commercial market. As a result of general protective vaccination in infected districts over a series of years the incidence of anthrax in Australia has gradually decreased, until at the present time outbreaks are sporadic in nature.—D. C. BLOOD.

KOLESOV, S. G. (1940.) Poluchenie protivosibireyazvennoĭ syvorotki ot loshadeĭ i baranov giperimmunizatsieĭ ubitoĭ kul'turoĭ Bac. anthracis. (Pervoe soobshchenie.) **[Anti-anthrax serum obtained from horses and sheep hyperimmunized by dead cultures of *Bacillus anthracis*. I.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 134–138. **1019**

Sporulating and vegetative cultures of *B. anthracis* were killed with brilliant green, crystal violet, or an unspecified bactericide and antigen was obtained by precipitating with potassium alum, and used for antiserum production.

K. points out that the method is much safer for personnel dealing with serum production than methods employing living *B. anthracis* cultures, and that antisera may be produced in 47 days from horses and 67 days from sheep.—L. LEVENBOOK.

MINETT, F. C., & DHANDA, M. R. (1942.) **Multiplication of *B. anthracis* and *Cl. chauvoei* in soil and in water.**—*Indian J. vet. Sci.* **11.** 308–328. **1020**

This enquiry concerned the belief that anthrax and blackleg are soil-borne diseases in the sense that under favourable conditions the causal organisms can lead a saprophytic existence in soil. *Bacillus anthracis* was found to be capable of extensive multiplication at 25°–30°C. in heat-sterilized soil, provided it was kept waterlogged; increases up to 30,000 times within two weeks were observed. A water content of 20% or over was generally suitable, but much depended on the texture of the soil, fine soil requiring more water than coarse soil. Active multiplication ceased towards the end of the second week, after which sporulation occurred. Growth also took place in soils enriched with manurial substances such as horse dung, vegetable manure, ammonium sulphate, lime and superphosphate, added separately or in combinations, provided such soils were heat-sterilized. Of 15 samples of soil of ascertained composition representing different types of soil from various parts of India, growth was obtained under favourable conditions in all but very acid soils.

In contrast to this, no evidence of growth was obtained, under otherwise favourable conditions, in unsterilized soil, whether enriched or not with manurial substances. Neither was there any growth in water standing over a thin layer of such soil. This was no doubt due to the antagonistic action of soil bacteria. The evidence strongly suggests that in nature the anthrax bacillus is mainly, if not entirely, an obligatory parasite and does not maintain itself as a soil saprophyte.

Some quantitative data are given as to the extent to which soil may become contaminated with *B. anthracis* from blood and nasal discharge of animals dying of anthrax. With blood from goats just dead of anthrax, counts of 22–370 millions per ml. were obtained. Blood-tinged nasal discharge from goats gave counts varying from 250,000 to one million per ml.

In the case of *Clostridium chauvoei*, the experimental findings indicate that under favourable conditions growth of the organism in sterilized or natural soil, if it occurs at all, is usually very restricted, even in the presence of added organic matter.—V. R. R.

BLAKEMORE, F. (1945.) **Infection of the bovine lungs with an organism resembling *Bacillus actinoides*.**—*J. comp. Path.* **55.** 132–139. **1021**

B. isolated an organism resembling *Bacillus actinoides* from two outbreaks of pneumonia. The organism was infective to calves when introduced intranasally, but not when given subcutaneously. It was not infective to mice by the intranasal route. When subcultured the organism became avirulent within a month.

B. compares the organism isolated with *B. actinoides* and *Streptobacillus moniliformis*.—W. R. KERR.

KNAYSI, G. (1945.) **A study of some environmental factors which control endospore formation by a strain of *Bacillus mycoides*.**—*J. Bact.* **49.** 473–493. **1022**

K. concludes that sporulation tends to be inhibited by the accumulation of by-products of metabolism. Oxygen, and in simple media vitamin B_1, favour sporulation, probably owing to the increase they cause in the rate of metabolism and in the degree of utilization of nutrients. A pH of 6·6–6·8 is optimum but sporulation occurs within a much wider range. Gradual drying is not usually an important factor. Magnesium sulphate increases the vegetative population and favours spore formation when the supply of oxygen is restricted. The formation of endospores by vegetative cells suspended in distilled water was confirmed; this supports the view that starvation in the presence of oxygen plays an important role. In contrast, germination in distilled water is only observed when nutrients are made available.—M. L. LEVI.

CLAY, A. L., & CHURCHWARD, R. E. (1944.) **Bovine tuberculosis: an attempt to eradicate the disease from two badly infected herds.**—*Aust. vet. J.* **20.** 322–328. **1023**

In one herd five tests were carried out at intervals of approximately four months, the single intradermal method being used and all reactors being slaughtered. There were no reactors in the last two tests but in a sixth test 14 months later, many positive reactions were obtained. An advanced case of TB. discovered at autopsy in a non-reactor was thought to have caused the breakdown of the eradication scheme. In the second herd 11 tests, made at erratic intervals by the double and later the single intradermal tests, were needed before reactions to the test failed to appear. The complement-fixation test was used to detect generalized cases not reacting to the tuberculin test. The authors point out that in herds with a high initial incidence of infection this test is a valuable adjunct to the tuberculin test.

The destruction of communal feeding troughs was thought to have been instrumental in the final eradication of the disease from the two herds. A high incidence in calves on the first property was probably related to the occurrence of tuberculous mastitis in two cows.

Lumps caused by the bites of cattle ticks in this North Queensland area sometimes render the assessment of skin fold thickness very uncertain and explain the occurrence of the large number of suspicious reactions. —D. C. BLOOD.

SMITH, H. R. (1944.) **Bovine tuberculosis in the United States. Its conquest and its effect on public health.**—*Amer. Rev. Tuberc.* **50.** 520–533. [Spanish summary.] **1024**

A detailed account is given of progress and results in the programme for the eradication of TB. in cattle in the United States, together with a brief history of the campaign.

Details are also given of the concurrent decrease in the human death rate which is stated to have gone down by 68% in the case of respiratory TB. and by 84% in other forms; this is attributed to a considerable extent to elimination of the disease in cattle.—D. D. O.

VEILLEUX, J. M. (1943.) Tuberculose bovine. **[Bovine tuberculosis (in Quebec).]**—*Laval Méd.* **8.** 380–399. **1025**

The author discusses bovine TB., especially as it occurs in Quebec, stating that before 1917, when quarantine regulations were passed making the tuberculin test compulsory on all cattle imported from Europe, the incidence was much higher in herds of "improved" cattle than in herds of "unimproved" cattle; young cattle of the early maturing breeds are said to be most susceptible to infection. It is stated that it has been well established that cattle may be infected by ingesting human tuberculous discharge but no evidence in support of this statement is cited.

The progress of official eradication schemes is briefly reviewed and some statistics are given, based on the results of inspection of carcasses in slaughter houses and of tuberculin tests. The figures given show a very great reduction in the percentage of reactors at the second test as compared with the first. For example, in the county of Stanstead 29·5% reacted at the first test, but only 0·6% reacted at the second, and in the county of Brome the corresponding figures were 25·4% and 0·7%. The interval between tests is not stated, but the tables suggest that it was about one year. V. states that in most of the areas reactors at the second test were less than 1%.—M. C.

ADAMSON, J. D., WARNER, W. P., KEEVIL, R. F., & BEAMISH, R. E. (1945.) **Tuberculosis in the Canadian Army 1939 to 1944.**—*Canad. med. Ass. J.* **52.** 123–127. [Copied *verbatim* from abst. in *Bull. Hyg., Lond.* **20.** 459. Signed: W. D. W. BROOKS.] **1026**

Full advantage has been taken of an unusual opportunity in the Canadian Army to study features of the epidemiology of tuberculosis. The Provinces of Canada from which the Army is recruited fall into two groups in regard to incidence of this disease. The four western Provinces and Ontario have relatively low incidences while the four most easterly Provinces have long presented a much higher rate of infection. Furthermore, approximately half the Canadian Army has served overseas in countries in which the incidence of tuberculosis is much higher than it is anywhere in Canada. Finally, for the whole Canadian Army radiological examination was a routine enlistment procedure, and only those without clinically significant pulmonary abnormality were recruited. The incidence of pulmonary tuberculosis, pleurisy with effusion and non-pulmonary tuberculosis in the Canadian Army overseas and at home are examined and it is shown that for all forms of tuberculosis the incidence is roughly twice as high in troops serving overseas as among those serving in Canada. It is also shown that the higher rates in overseas troops are mainly due to infection of troops who come from the less tuberculous parts of Canada. It is known that a very high proportion [over 50 per cent. it is reported elsewhere] of these troops were tuberculin negative and, by inference, relatively non-resistant to infection. On coming into contact with a tuberculous environment they show immediately a considerably greater number of cases of pleurisy with effusion, a more gradual and smaller increase in cases of pulmonary tuberculosis, and a late and still smaller increase in other forms of tuberculosis as compared with troops recruited from more heavily infected areas.

FRANCO, A. (1943.) La vacuna japonesa A-O contra la tuberculosis. **[The Japanese A-O type vaccine for TB.]**—*Gac. vet., B. Aires.* **5.** 276–284. **1027**

F. describes the characters of the A-O vaccine which is composed of highly antigenic strains of human type tubercle bacilli, the protoplasm of which is in an unaltered state. It is stated that it stimulates neither allergy nor secondary reactions.

The vaccine may be used therapeutically, prophylactically and as a diagnostic agent. The latter test promotes what is known as the Yoshida reaction and is based on the fact that, when injected into a tuberculous subject A-O vaccine causes a reduction in the number of circulating leucocytes. This reaction is stated to be not only qualitative but quantitative, the claim being that it detects the severity of the infection.—I. W. B.

MURPHY, W. J. B. (1944.) **Avian tuberculosis in New South Wales, with notes on the application of the intradermal avian tuberculin test.**—*Aust. vet. J.* **20.** 291–295. **1028**

The first recorded occurrence of avian TB. in poultry in New South Wales is described. Birds of the affected flock were tested by the double intradermal method, using 0·05 ml. of avian tuberculin injected near the lower border of the wattle.

Attention is drawn to the absence of this disease as observed by M. in a three years' poultry survey in the Sydney metropolitan and adjacent areas.—D. C. BLOOD.

SIGURDSSON, B. (1945.) **A specific antigen recovered from tissue infected with *M. paratuberculosis* (Johne's bacillus).**—*J. Immunol.* **51.** 279–290. **1029**

In chronic diseases it is difficult to prepare tissue antigens capable of fixing complement in the presence of immune sera. It is probable that the development of these antigens takes place slowly and is accompanied by the appearance of anti-infective agents which may mask the presence of the antigen.

Preliminary tests showed that in Johne's disease of sheep, saline suspensions of the intestinal mucosa from infected animals failed to fix complement in the presence of serum from affected cases. If, however, the mucous membrane was first dried *in vacuo* at 40°C. and then treated with ether or acetone, the resulting product was quite active. Methods of conducting the test are described.

Using this new antigen, satisfactory results were obtained with sera from natural cases of the disease. Thus, out of 34 infected sheep, the sera of 31 (91%) reacted positively, whereas those from 68 sheep in a non-infected area were negative. The value of the complement-fixation test as a means of diagnosing occult cases is discussed.—R. E. GLOVER.

HOEBEN, J. G. H. (1942.) **Abscesses due to infection with *Corynebacterium pyogenes* in bovines.**—*Aust. vet. J.* **18.** 209–211. **1030**

Three cases are described in which large superficial abscesses, affecting a hind limb, the thorax and the preputial region respectively in cattle, were found to be

infected with *Corynebact. pyogenes*. Destruction was advised in one case but the others made successful recoveries after surgical intervention and treatment.

H. states that the important points arising from these cases are the long period of abscess formation and the slight tendency of the abscesses to "point", the greater pain than is usual with chronic abscesses, the importance of pyrexia as a symptom and the excess of fibrous tissue produced.—J. D. STEEL.

BROOKS, R. F., & HUCKER, G. J. (1944.) **A study of certain members of the genus Corynebacterium.**—*J. Bact.* **48.** 295–312. **1031**

Seventy-nine cultures of the genus *Corynebacterium* which had been isolated from a wide variety of animal sources were examined for their morphology, cultural characters and biochemical activities. At least 20 tests were applied to each culture in an attempt to find a good basis for differentiating the species within this genus. A consideration of six of their more constant characters, *viz*, pellicle formation in nutrient broth, action in litmus milk particularly in regard to alkali production, pigment production on coagulated serum, reduction of nitrate to nitrite, hydrogen sulphide production and final reaction in glucose broth led to the logical subdivision of this collection of animal diphtheroids into three groups, the active group, with *Corynebact. equi* as a typical member, the inactive group including *Corynebact. pyogenes* and a third intermediate group, probably including *Corynebact. flavidum*. A consideration of serological properties and pathogenicity might necessitate the subdivision of the three main groups.—J. KEPPIE.

CHAWDHURY, S. K. (1944.) **Glanders in India.**—*Indian Fmg.* **5.** 269–271. **1032**

A popular article dealing with glanders on conventional lines but without addition of new knowledge. —M. M. HUQ.

REMLINGER, P. (1945.) Chromo-vaccination des pasteurelloses. **[Vaccination against pasteurellosis with cultures inactivated by treatment with dyes.]**—*Arch. Inst. Pasteur Algér.* **23.** 50–55. **1033**

When young cultures of *Pasteurella septica* are treated with basic dyes like gentian violet or basic fuchsin, the organisms are progressively attenuated and finally killed. A vaccine was prepared which when injected in multiple and/or large doses into a small number of rabbits resulted in a satisfactory immunity. *Pasteurella aviseptica* vaccine did not, however, protect the rabbits against a strain of *Pasteurella boviseptica*, nor *vice versa*.—M. L. LEVI.

HOLLER, G. (1944.) Zur Symptomatologie und Diagnose der Tularämie. **[The symptoms and diagnosis of tularaemia.]**—*Dtsch. Militärarzt.* **9.** 137–142. [Abst. in *Bull. Hyg., Lond.* **20.** 322, copied *verbatim*. Signed: R. LOVELL.] **1034**

A general description of tularaemia is given and attention paid to its aetiology, the common animal reservoirs of infection and its incidence in various occupations. Cases have occurred amongst the military personnel in the Eastern theatre of war: the types of disease are described. Infection is acquired from animals, mainly rodents, and man to man infection is, at least, rare. There is a primary focus of infection with a regional lymphadenitis; the ulcero-glandular type is an example of the complete primary complex with the swelling of the gland and pustule formation. The primary lesion may be almost anywhere, but especially on the hand, the conjunctiva, the mouth involving the tonsils, or even the scrotum. A pulmonary form with nodules in the lungs occurs and a typhoid-like form also; infection has been noted in the mesenteric lymph glands, the spleen and the liver.

Initial symptoms include headache and fever; regional lymph glands become swollen and pus is formed. The fever usually lasts for two or three days, after which there is a fall in temperature: this is followed a few days later by a secondary rise which may persist for weeks.

Apart from the pulmonary and abdominal types, diagnosis depends on the recognition of the primary complex with the swelling of the localized lymph glands. A continuous fever of three or more days' duration, especially if followed by a fall in temperature and a secondary rise, should excite suspicion of tularaemia in an area where it is known to exist in man or animals. The diagnosis may be confirmed by the recovery of *Bact. tularense* from the blood, or pus or glandular material or material after sternal puncture. The serum of the patient may be examined for agglutinins, which appear during the second or third week of illness and rise to a maximum after four to seven weeks. A specific skin reaction produced by inoculation of a vaccine prepared from *Bact. tularense* is of value if positive.

I. HESSELBROCK, W., & FOSHAY, L. (1945.) **The morphology of Bacterium tularense.**—*J. Bact.* **49.** 209–231. **1035**

II. FOSHAY, L., & HESSELBROCK, W. (1945.) **Some observations on the filtrability of Bacterium tularense.** —*Ibid.* 233–236. **1036**

[Authors summaries copied *verbatim*.]

I. *Bacterium tularense* is an extremely polymorphous microorganism. It possesses neither capsules nor flagella, and is nonmotile. Its morphologic units include globi and globules, flat and cylindrical bacillary forms, coccoid forms, delicate filaments, and minimal reproductive units. Many forms, under certain conditions of staining, reveal prominent, thick cell walls. The cell wall is, of course, an integral structural unit with no relation to degree of invasiveness or virulence. All 43 strains were morphologically identical. We found no morphologic feature to differentiate a virulent from a nonvirulent strain. All strains seemed to possess multiple modes of reproduction, and budding was apparently the chief one. Division by binary fission was not observed, though it may occur. Although the organism seems to be related to the pleuropneumonia group, perhaps only distantly related, we suggest postponement of taxonomic efforts until the members and relations of this group are better defined. For the present we urge invalidation of the terms, *Pasteurella tularensis*, *Brucella tularensis*, and *Coccobacterium tularense*, and retention of *Bacterium tularense* as the most suitable temporary designation.

II. The filtrable form of *Bacterium tularense* in gradocol membrane filtrates of gelatin hydrolyzate medium cultures of highly virulent strains produced tularemia in the highly susceptible mouse and was recoverable in the form of larger morphologic units by heart blood cultures. These filtrable forms were approximately 300 to 350 mμ in diameter. We are reasonably sure that minimal reproductive units of smaller size exist, and that accurate measurement will require better cultural conditions than those hitherto obtained. Morphologic studies of cultures obtained from mice inoculated with filtrates demonstrated that the filtrable units were capable of development into all other morphologic units known for this organism.

OLITZKI, L. (1944.) **Salmonella—Strains isolated in Palestine from different sources.**—Reprinted from *Palestine Vet. Surg. Ass. Bull.* July. [In Hebrew pp. 1–5, English summary pp. 6–8.] [Abst. in *Bull.*

Hyg., Lond. **20.** 503, slightly amended. Signed : R. LOVELL.] **1037**

A brief record is given of the Salmonella isolated in recent years in Palestine.

Salmonella paratyphi-A, *S. paratyphi*-B, *S. paratyphi*-C, *S. cholerae-suis.* var *kunzendorf*, *S. montevideo*, *S. newport*, *S. glostrup*, *S. typhi*, *S. newington* and *S. senftenberg* were isolated from human sources only.

S. typhi-murium was recovered from man, hamsters, guineapigs, rabbits, cattle, turkey, geese, ducklings and chicken ; *S. oranienburg* from man and chicken ; *S. bovis morbificans* from man, pigs, hamsters, guineapigs, turkeys, chicken and a horse ; *S. muenchen* from man, ducklings and chicken ; *S. enteritidis* from man, dog ticks, cattle, ducklings and chicken ; *S. kentucky* from man, camels and mice.

The remainder were isolated from animals only :– *S. abortus-equi* from a donkey ; *S. chester*, *S. reading*, *S. kottbus*, and *S. gallinarum* from ducklings and chicken ; *S. rostock* from cattle ; *S. pullorum* from chickens ; *S. london* from rabbits ; *S. anatum* from chickens ; *S. tel-aviv* from chickens ; *S. kirkee* from hedgehog ticks and an unnamed salmonella from dogs and white mice. This latter organism has an antigenic formula as follows :–VI, XIV, XXIV, r, 1,7.

CRAWFORD. (1942.) **The control of bovine brucellosis in the United States of America.**—*Aust. vet. J.* **18.** 214–216. **1038**

C. discusses the methods used for the control of brucellosis in America. No new information is presented.—J. D. STEEL.

SEIT, B., & JØRGENSEN, K. L. (1944.) Abortus-Bang-Ringprøvens Vaerdi som diagnostisk Hjaelpemiddel. **[Value of the *Brucella abortus* ring test for bovine brucellosis.]**—*Maanedsskr. Dyrlaeger.* **56.** 277–292. **1039**

The ring test [see also *V.B.* **9.** 799] of mixed milk for brucella agglutinins was carried out in 14 dairying districts in Bornholm on 3,753 samples from 3,362 farms and the results were compared with those of blood agglutination tests which had been made independently during the preceding year.

Samples from 2,768 farms were negative to each test and samples from 465 were positive to both tests ; in 57 cases the milk was positive and the blood negative and in 72 cases the milk was negative and the blood positive.

This represents a 96% agreement between the two tests. The ring test is accurate to a high degree, but is limited to animals which are in lactation. Sources of error in the two tests are discussed.—J. E.

JØRGENSEN, K. L. (1945.) Abortus/Bang-Agglutininer i Blod og Maelk efter Vaccination med draebt Kultur. **[*Brucella abortus* agglutinins in the blood and milk after vaccination by killed culture.]**—*Maanedsskr. Dyrlaeger.* **57.** 197–206. **1040**

The literature on the ring test for milk brucella agglutinins is reviewed. It has been suggested that the presence of antibodies in the milk and their absence from the blood may indicate their formation locally in the udder, but the original work reported here does not support this theory. Seven cows were inoculated with a dead vaccine and were blood- and milk-tested. Agglutinins were demonstrated first in the blood and later in the milk, giving evidence that antibodies in milk originate from the blood.—J. E.

TURNER, A. W. (1944.) **"Brucella abortus 'strain 19' vaccine : its use in reducing wastage from contagious abortion".**—*Aust. vet. J.* **20.** 311–314. **1041**

T. describes the methods used by the Victorian Department of Agriculture. Vaccination is voluntary and carried out only in infected herds. All non-pregnant animals in the herds are vaccinated subcutaneously at a cost of sixpence per head, a dose of 5 ml. being given. The method of preparation of the vaccine is described. Field results are not yet available but experimental work indicates that injection of a 1 ml. dose into the tail may be as effective as or more effective than 6 ml. given subcutaneously, as judged by agglutinin response. —D. C. BLOOD.

HOLMAN, H. H., & MCDIARMID, A. (1945.) **An observation on reduction in milk yield following vaccination of lactating cows with living vaccines prepared from Brucella abortus.**—*Vet. Rec.* **57.** 335–336. **1042**

The daily milk yield of six cows inoculated with 5 ml. of strain 19 and of eight cows inoculated with two doses of 4 ml. each of strain 45/20 given with an interval of three weeks, was compared with that of 15 control cows. A loss of milk yield averaging 24 lb. per cow followed the inoculations. The loss was most pronounced 2–4 days after inoculation, and was negligible nine days after inoculation. The loss in individual cows varied greatly (from 0·3–80 lb.) and this variation prevented an accurate comparison of losses resulting from inoculation with strain 19 and losses resulting from inoculation with strain 45/20.—S. J. GILBERT.

NIKOLAEV, V. A. (1940.) Sterilitet korov pri brutselleze. **[Infertility in cattle during brucellosis.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 83–95. **1043**

N. describes his observations on bovine brucellosis from 1931–36 dealing with the incidence and importance of the disease from a statistical viewpoint. Of all sterile cows examined, 10% were incurable on account of brucella infections of the deeper regions of the genital tract and of 152 brucella-infected cows, over 50% were sterile for 1–2 years and the remainder for periods of six months to three years. 60% of known brucella infections were confirmed by means of agglutination reactions and a further 29% by means of abortin.

The pathological changes due to brucella infections of varying age are described. Up to three consecutive abortions were obtained in 12 cows mated 2–4 months after a previous abortion. The destruction in infected ovaries of follicles and corpora lutea is not recommended, since this has resulted in complete sterility. Prophylactic and curative measures are discussed, but no new data are given.—L. LEVENBOOK.

KOVALENKO, Y. R. (1940.) Gemoliticheskie svoïstva vozbuditelya emfizematoznovo karbunkula krupnovo rogatovo skota (Bac. chauvoei). **[Haemolytic character of *Clostridium chauvoei*.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 96–108. **1044**

The most successful medium for the growth of *Cl. chauvoei* appeared to be liver broth. In this medium cultures produced in 18 hours a haemolysin able to lyse actively sheep, pig and cattle red cells. *Cl. septicum* produced similar haemolysins in much the same time. During a three-hour test period *Cl. chauvoei* haemolysin had no action on horse and g. pig red cells and very little action on erythrocytes of the fowl and pigeon and *Cl. septicum* haemolysin had no action at all.

The haemolysins produced by both groups of organisms vary greatly in amount and activity according to the type of culture and the medium employed.

Cl. chauvoei haemolysin is reasonably stable for up to 40 days, is thermolabile, being destroyed in 15 min. at 45°–46°C., is filtrable through the usual bacteriological filters and is destroyed by incubating with 0·75% phenol or 0·5% formalin ; the dried precipitate

obtained with ammonium sulphate will retain its activity for up to five months.

It is suggested that the minimum haemolytic dose of such haemolysin samples should be the amount that in 10 min. will lyse 3 ml. of a 0·2% (by weight) suspension of washed sheep red cells.—L. LEVENBOOK.

MACFARLANE, R. G., & MACLENNAN, J. D. (1945.) **The toxaemia of gas-gangrene.**—*Lancet.* **249.** 328–331. **1045**

The clinical features of the toxaemia are discussed, and the authors suggest that it is not due to *Clostridium welchii* α-toxin, but to some breakdown product of muscle. Rabbits injected intravenously with culture filtrate of *Clostridium welchii* Type A died with haemoglobinaemia and haemoglobinuria. Rabbits injected intramuscularly died with shock symptoms similar to those seen in human beings and there was no haemolysis. The authors suggest that there is a "collagenase" factor which lyses the collagen sheath of the muscle. The fact that it appears to require calcium for its action and that hyaluronidase and lecithinase do not attack collagen *in vitro* leads them to believe that collagenase is a distinct factor. They suggest that, should this factor be antigenic, an antiserum against it would prevent muscle disintegration and the release of the toxic by-product and thus be more effective than the present antiserum, which has only slight effects even in large doses on cases of advanced toxaemia in the absence of surgical removal of gangrenous muscle. In further support of their theory, they quote two cases, one of *Cl. welchii* cellulitis and one of *Cl. welchii* infection of the brain, where the toxaemia was only slight; this, they suggest, was due to the absence of muscle breakdown products.—R. M. LOOSMORE.

ROBB-SMITH, A. H. T. (1945.) **Tissue changes induced by *Cl. welchii* type A filtrates.**—*Lancet.* **249.** 362–368. **1046**

In the light of work done by MACFARLANE *et al.* [see preceding abst.] the author presents a critical histological study of great detail. He surveys the histological changes in human muscle *in vivo* in *Cl. welchii* Type A infection and *in vitro* in filtrates of the organism and finds them identical, with the exception of the absence of oedema and gas formation *in vitro*. The most striking feature is the absence of inflammation and the lack of cellular response. In fact, leucocytes in the region undergo cytolytic changes preventable by antitoxin. This leads the author to suppose that there may be a nuclease factor in the filtrate. Other histological changes are explained in terms of the enzymatic activity of lecithinase, hyaluronidase and lipase elements. The presence is confirmed of a collagenase element, lysing the collagen and reticulin fibrils surrounding the muscle fibres. The myofibril is unaffected and does not lose its cross-striation, indicating that there are no proteolytic enzymes in the filtrate. Fragmentation is due to muscular activity when the myofibril is unsupported by the collagen reticulin sheath.

Finally the author discusses the suggestion of MACFARLANE *et al.* that death is not due to circulating toxin, presenting further evidence from the literature and recommending the local injection of antitoxin as a therapeutic measure.—R. M. LOOSMORE.

IMŠENECKI, A. (1945.) **On the structure of anaerobic bacteria.**—*J. Bact.* **49.** 1–5. **1047**

In continuation of work published in 1939–40 the author gives a preliminary account of the differences in cytological structure between aerobic and anaerobic spore-producing bacteria. The most characteristic feature of aerobic bacteria is the presence of lipoprotein inclusions which probably represent stores of reserve substances; the inclusions disappear during starvation of the cells and increase in size when the organisms have access to carbohydrate. Such inclusions are not present in anaerobic bacteria and it is suggested that anaerobic conditions of life make utilization of fat impossible. On the other hand, anaerobic organisms may contain carbohydrate inclusions and the quantity of these inclusions diminishes during spore formation. —E. G. WHITE.

SMITH, W. E., & ROPES, M. W. (1945.) **Bacteroides infections. An analysis based on a review of the literature and a study of twenty cases.**—*New Engl. J. Med.* **232.** 31–37. [Abst. in *Bull. Hyg., Lond.* **20.** 355–356, copied *verbatim.* Signed: J. C. CRUICKSHANK.] **1048**

The genus *Bacteroides* comprises the non-sporing anaerobic Gram-negative bacilli. These bacilli, which are common inhabitants of the mucous membranes, especially of the naso-pharynx, gastro-intestinal tract, cervix and vagina, tend to be missed in routine work because they are anaerobic, grow slowly and often require serum in the medium. In certain strains a form of reproduction other than simple fission, and associated with production of the pleuro-pneumonia-like colonies as variant growth forms (L-type variation), has been described. Classification of strains can be made into a non-pleomorphic group and a pleomorphic group characterized in artificial culture by the formation of filaments and large spheres which are not spores. These morphological groups appear to correspond to serological groups.

The authors review the literature and describe 20 cases of *Bacteroides* infection in the Massachusetts General Hospital in the years 1939–43. Three of the cases terminated fatally. From their normal habitat the organisms may invade the tissues, blood or body cavities by extension of local inflammatory processes. The occurrence of metastatic abscesses, which appear mainly in the lungs, pleural cavities, liver and joints, is of grave significance.

The types of disease which have been encountered are as follows: (1) *Bacteroides septicaemia*, arising from throat infections, otitis media and mastoiditis, surgery or infections of the large bowel or genito-urinary tract, and war wounds. The more severe cases which are also more frequent, are due to the pleomorphic type. They may be diagnosed by anaerobic blood culture or isolation of the organisms from the pus from the abscesses. The pus is thick, greenish-yellow and somewhat foul. Gas may be present in the tissues. A polymorphonuclear leucocytosis, with a white cell count of 14,000 to 22,000 is usual. (2) *Bacteroides meningitis* is acute, usually fatal, and runs a course similar to infections by other pyogenic organisms. Unless anaerobic culture is made, cases might be mistaken for meningitis due to *Haem. influenzae.* (3) *Bacteroides peritonitis* was found in cases where there was leakage from the bowel. It did not necessarily signify an unfavourable prognosis. (4) *Local bacteroides infections*, chiefly causing purulent lesions of the middle ear, genito-urinary tract, lung and skin.

Treatment is surgical and there is no evidence to suggest that sulphonamides are of value. While most infections appear to be endogenous in origin, a series of cases in soldiers with gunshot wounds, reported by BOGDAN (Med. Klin., 1916, v. 12, 383) in Hungary in the first World War, suggested that the disease might spread as a hospital cross-infection.

PEPPLER, H. J., & TWIEHAUS, M. J. (1942.) **Equine sporotrichosis.**—*Trans. Kans. Acad. Sci.* **45.** 40–46. [Authors' summary copied *verbatim.*] **1049**

A lymphangitis found to be sporotrichosis was observed in six horses. All animals recovered from the disease after intravenous and external treatment with iodine. The infectious agent was isolated in pure culture and identified as a *Sporotrichum* sp. producing a black pigment on all solid culture media studied. The pathology of the disease and the virulence of the sporotrichum will be reported in detail elsewhere.

BOBYLEVA, E. A. (1940.) Uskorennyĭ metod biologicheskoĭ diagnostiki nekrobatsilleza i vydeleniya chistykh kul'tur Bac. necrophorus. **[Rapid biological diagnosis of necrobacillosis and isolation of pure *Fusiformis necrophorus* cultures.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 148–151. **1050**

B. refers to the convenience of the rabbit as a test animal in connexion with *F. necrophorus* infection. There is no new material.—L. LEVENBOOK.

PUSHMENKOV, E. P. (1940.) Reaktsiya agglyutinatsii v diagnostike tak nazyvaemoĭ kopytnoĭ bolezni severnykh oleneĭ. **[An agglutination test for diagnosis of foot rot of reindeer.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 145–147. **1051**

Sera from reindeer naturally and artificially infected with foot rot would not agglutinate with the antigen derived from the anaerobic, threadlike type of causal organism, but would with that of the aerobic, short type.

The above agglutination was obtained with sera diluted 1 : 25. Sera from healthy animals did not agglutinate when either undiluted, or diluted 1 : 5.
—L. LEVENBOOK.

KLIENEBERGER-NOBEL, E. (1945.) **Pleuropneumonia-like organisms in the human vagina.**—*Lancet.* **249.** 46–47. **1052**

Examination of cultures (on a boiled blood medium enriched with 30% sterile horse serum) from the vaginae of patients of a venereal disease clinic and a hospital, showed that pleuro-pneumonia-like organisms occurred much more frequently (in 18 of 45 cases) where some pathological condition, especially gonorrhoea or syphilis, was present, than in pregnant women, where only seven of 50 examined showed such organisms. It is not known whether the pleuro-pneumonia-like organisms are harmless saprophytes encouraged to multiply by the pathological conditions or pathogenic in themselves.
—J. B. BROOKSBY.

NUTINI, L. G., KREKE, C. W., & SCHROEDER, M. P. (1945.) **Further studies on the effects of spleen extract on bacteria.**—*J. Bact.* **50.** 177–185. [Authors' summary copied *verbatim.*] **1053**

Although spleen extract in concentrations of 0·05 per cent allows growth of *Streptococcus pyogenes*, it produces morphologic differences and perhaps changes in the biochemistry of the organism. In higher concentrations it is germicidal to the organism.

Extracts from human and beef spleens, even in high concentration, have no germicidal effect on *Staphylococcus aureus.* Spleen extract, after initially depressing the growth of *S. aureus*, later stimulates it. Along with this stimulation the original orange organism is transformed to a white type. The white organism is unstable and remains white only after frequent cultures and subcultures in media containing the extract.

The growth of pneumococci is unaffected by the spleen extract.

The colon-typhoid-dysentery group reacts to the spleen extract with increased growth and changes in the size and shape of the organisms.

The growth of the tubercle bacillus is inhibited by spleen extract.

PETERSON, W. H., & PETERSON, M. S. (1945.) **Relation of bacteria to vitamins and other growth factors.**—*Bact. Rev.* **9.** 49–109. **1054**

In this review the authors give the requirements of biotin, nicotinic acid, pantothenic acid, pyridoxine, *p*-aminobenzoic acid, riboflavin, thiamine and other factors for almost 200 species of micro-organisms. The available data on the synthesis of growth factors by different organisms and methods of assay using bacteriological methods are also tabulated. The unidentified growth factors are considered and the structural specificity and function of growth factors are discussed.
—E. BOYLAND.

See also absts. **1165** (staphylococci), **1168** (TB.), **1169** (swine erysipelas), **1170-1172** (coliform organisms), **1172, 1228** (salmonella), **1173** (actinomycosis), **1203** (tetanus), **1113** (lamb dysentery, pulpy kidney disease, foot rot of sheep), **1151-1160** (antibiotics).

DISEASES CAUSED BY PROTOZOAN PARASITES

I. KLEINE, F. K. (1942.) Ist eine Immunisierung von Rindern gegen die Tsetsekrankheit (Nagana) möglich ? **[Can cattle be immunized against nagana ?]** —*Dtsch. tierärztl. Wschr.* **50.** 499. **1055**

II. SCHILLING, C. (1942.) Ist eine Immunisierung von Rindern gegen die Tsetsekrankheit (Nagana) möglich ? **[Can cattle be immunized against nagana ?]** —*Ibid.* 500. **1056**

I. K. refuses to accept Schilling's claim that cattle can be immunized against trypanosomiasis by the method of minimal infection and suggests that game have a natural immunity to the disease similar to that shown by goats, sheep and donkeys.

II. S. points out that although three of his immunized calves succumbed to inoculation with massive doses of trypanosomes, six have nevertheless thrived in an area heavily infested with tsetse [see HORNBY—*V. B.* **12.** 407]. He thinks that no comparison of the natural immunity of cattle and of game can be made without simultaneous infection of newly born game animals and calves.—U. F. RICHARDSON.

AVESSALOMOV, I. S. (1940.) Metod izgotovleniya sukhovo tripanozomnovo antigena. **[Preparation of dry *Trypanosoma* antigen.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 247–253. **1057**

The preparation of dry *Trypanosoma* antigen, suitable for the complement-fixation test for dourine and surra, is described in detail.

The trypanosomes, having been separated from the blood in the usual manner, are washed in physiological saline and centrifuged a number of times, following which they are extracted with ten times their volume of either acetone or ether, and subsequently dried in a constant temperature oven at 37°–38°C. for 4–48 hours until all traces of the solvent have evaporated. Finally they are ground to a powder under sterile conditions.

For the test, a 0·5% suspension is prepared in physiological saline (with a trace of phenol) and this is allowed to stand in the dark for 24 hours prior to use. Dilutions of the dry antigen of from 1 : 8,000 to

1 : 16,000 are used. Concentrations of about 1 : 200 produce a much weaker reaction.

Both the dry antigen and its aqueous suspension are thermolabile at 40°–50°C. and are sensitive to light. The dry powder will keep for over a year in an hermetically sealed ampoule kept in a cool dark place. Under similar conditions the suspension will remain active for two months.—L. LEVENBOOK.

COATNEY, G. R., COOPER, W. C., & TREMBLEY, H. L. (1945.) **Studies on *Plasmodium gallinaceum* Brumpt. III. The incidence and course of the infection in young chicks following the subcutaneous inoculation of pooled sporozoites.**—*Amer. J. Hyg.* **42.** 323–329. [For previous parts, see *V. B.* **15.** 354.] **1058**

The authors present data on the infections produced in 440 chicks of less than one week of age after subcutaneous injections of a sporozoite suspension formed by comminuting whole mosquitoes (*Aëdes aegypti*) infected with *P. gallinaceum*. It was arranged that each chick received a dose of one mosquito equivalent of sporozoites. An incidence of 99·8% infection was obtained with a mean prepatent period of about 7·8 days. Parasitaemia attained a mean peak at about two days after patency and the parasite count was 3,439 ± 89 parasitized cells per 10,000 r.b.c.'s. The mortality amongst infected birds was 98·4%. Exo-erythrocytic forms were found in brain smears taken from approximately half the birds dying of the infection. Injection of pooled sporozoites is less time-consuming and is more certain of producing infections, but death is more likely to result and will occur sooner than by other methods described.—C. HORTON SMITH.

BELTRAN, E. (1943.) Características de la cepa mexicana (14 B) de Plasmodium juxtanucleare Versiani y Furtado, 1941. **[Characters of the Mexican strain of *P. juxtanucleare*.]**—*Rev. Inst. Salubr. Enferm. trop.* **4.** 265–272. [Abst. from author's English summary.] **1059**

Data are presented regarding the morphology and biology of the Mexican strain of *P. juxtanucleare*, which shows a very close relationship with the Brazilian strain (14 A). Mortality is high 1–8 months after inoculation. The prepatent period may be as long as 38 days. The numbers of parasites are never as high as with *P. gallinaceum* infection and there seems to be no cross-immunity. The vector is not yet known. The schizogony is not yet fully worked out, but a cycle of about 24 hours is indicated, with low synchronicity.

*ANON. (1941.) **[Control of piroplasmosis.]**—*Vet. Ges. Moskau.* pp. 298–302. [Abst. from abst. in *Z. Veterinärk.* **54.** 339.] **1060**

A map in the Russian article shows the distribution of the various species of piroplasms and the transmitting ticks; instructions are also given on the control of piroplasmosis. Detailed recommendations are made on the restriction of movement of animals into and out of infected areas, covering movements both during and out of the tick season.

For control of equine piroplasmosis, periodic treatment with kerosene-soap-arsenic washes or sprays is recommended, together with the avoidance of tick-infested pastures, the destruction of rodents which may act as reservoir hosts for ticks, and pasture improvement. For ovine piroplasmosis, periodic dipping with sodium arsenite is recommended, and watering places should be cleared of rough herbage. In areas where cases occur throughout the year, prophylactic treatment with acriflavine within three days of the first appearance of ticks in the spring, and repeated periodically, is advised. For horses in enzootic areas, similar prophylactic treatment is prescribed, using trypanblue for *Babesia caballi* and acriflavine for *B. equi* infections. For cattle, ichthargan, albargin, acriflavine, or "arsenal" should be used for the small piroplasms, and trypanblue, acriflavine, or ichthargan for *B. bigemina*.

For *Theileria* and *Anaplasma* infections, symptomatic treatment is recommended; for mixed infections acriflavine gives the best results. Severe cases may be treated twice at intervals of 24 hours, but heart stimulants should be kept in readiness. Concentrates should not be fed to febrile animals. Dosages are laid down for the various drugs, but the German abstract is not clear as to the actual doses or methods of administration.—U. F. RICHARDSON.

DZASOKHOV, G. S. (1940.) Dlitel'nost' sokhraneniya vozbuditelya babezielløza ovets v kleshche Rhipicephalus bursa. **[The viability of *Babesia ovis* in *Rhipicephalus bursa*.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 241–242. **1061**

Breeding of a generation of *R. bursa* on an "unsatisfactory" host, *viz*, a horse, did not prevent the following generation from acting as *Babesia* vectors and infecting healthy sheep. As a result of laboratory experiments it is concluded that allowing such "unsatisfactory" hosts to graze on infested sheep pastures for a period of one year, in no way reduces the risk of *B. ovis* infection in sheep subsequently introduced to the pastures.

In D.'s experience, only the adult and not the nymphal stages of *R. bursa* could transmit the disease. —L. LEVENBOOK.

BUCKLAND, F. E., & STUART, R. D. (1945.) **Mud fever (leptospirosis) in the British Army in France.**—*Lancet.* **249.** 331–333. **1062**

Eight types of human leptospira are known to exist in Europe, *L. icterohaemorrhagiae*, *L. canicola*, *L. grippo-typhosa*, *L. sejroe*, *L. bataviae*, *L. pomona*, *L. australis* A and *L. australis* B. *L. icterohaemorrhagiae* predominates amongst suspected leptospirosis cases in military personnel and is the only type which has been detected in Great Britain, although it is suggested that this may be due to failure to recognize the symptoms of other types. Two infections of *L. grippo-typhosa* and one of *L. sejroe* are now recorded from the Army in France.—U. F. R.

See also absts. **1174** (trypanosomiasis), **1175** (canine coccidiosis), **1209** (blood smears in malaria).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

SPECHT, F. (1943.) Bemerkungen zur Maul- und Klauenseuche beim Menschen. (Zur Arbeit von Dr. O. Scholl, Ueber zwei Fälle von Maul- und Klauenseuche usw.) **[Reflections on foot and mouth disease in man.]**—*Münch. med. Wschr.* **90.** 168–169. [Abst. in *Bull. Hyg., Lond.* **20.** 325–326, copied *verbatim*. Signed: R. LOVELL.] **1063**

Specht refers to the article of Scholl [see *V. B.* **15.** 76] and suggests that the disease described was not foot and mouth disease. The inoculation of material into the pad of guineapigs would not of itself be final proof. He described a similar case in 1930 and guineapigs receiving an injection of material from his case developed vesicles at the site of inoculation in the pad,

with round cell infiltration, but the case was not regarded as one of foot and mouth disease. Specht quotes Prof. THOST-HAMBURG, who doubted if cases of foot and mouth disease ever occurred in man. The disease was probably a virulent septic form of stomatitis, and the information that sulphathiazole is valuable for the treatment of these cases is useful.

RAMON, G., LEMÉTAYER, E., LASFARGUES, E., MINGUET, P., NICOL, L., RAMON, P., VIRAT, B., VIRAT, J., & YEU, F. (1944.) Sur un sérum obtenu chez le cheval avec le virus ou l'anavirus aphteux; ses propriétés préservatrices à l'égard de l'infection aphteuse en incubation. Etude expérimentale sur le cobaye. **[Prophylactic properties of a serum against foot and mouth disease prepared in horses, using virus or anavirus; experimental studies on the g. pig.]**—*Bull. Acad. vét. Fr.* **17.** 49–52. **1064**

The authors have extended their observations on an antiserum prepared in a horse to the virus of F. & M. disease [see *V. B.* **14.** 7]. It was found that good protection against generalization was afforded g. pigs if a moderately high dosage of serum (1·5 ml.) was administered two and six, but not 24 hours after inoculation with the virus. The dose of virus employed is not stated but appears to have been more than 10 minimum infective doses.—J. B. BROOKSBY.

BRINET. (1944.) L'hémoprévention de la fièvre aphteuse en clientèle. **[Blood plasma injection in the clinical treatment of foot and mouth disease.]**—*Bull. Acad. vét. Fr.* **17.** 249–251. **1065**

An account is given of the use of convalescent plasma in the clinical control of F. & M. disease. In herds in which the disease had not appeared, but which were adjacent to fresh outbreaks, 800 ml. of plasma were given to adult animals and 150 ml. to young stock. Next day the treated animals were exposed to virus by rubbing the buccal mucosa with virulent material or by mixing virus with the food. An abortive attack of the disease was noticed in some animals in which plasma treatment had been delayed, and in herds in which the disease had already appeared the treatment was frequently of no value. In sheep flocks at lambing time, newly born lambs were given 20 ml. of plasma subcutaneously. Lambs being suckled by diseased ewes sometimes died owing to the failure of milk secretion in the mothers.—J. B. BROOKSBY.

HEINY, E. (1945.) **Vesicular stomatitis in cattle and horses in Colorado.**—*N. Amer. Vet.* **26.** 726–730. **1066**

Outbreaks of vesicular stomatitis occurred in Colorado in 1942 (Indiana type of virus), 1943 (type of virus not determined), and 1944 (New Jersey type of virus). Cattle were first and mainly affected in these outbreaks and besides the mouth lesions often showed teat and occasionally foot lesions. Horses were also affected and suspicious lesions were reported in pigs and in three human beings, but were not submitted to laboratory examination. There was no evidence that the virus was spread by direct contact.—E. COTCHIN.

BRONSON, L. H., & PARKER, R. F. (1944.) **Vaccinal infection in the mouse.**—*J. Immunol.* **49.** 193–202. [Authors' conclusion copied *verbatim.*] **1067**

Following intracerebral insertion of vaccine virus in mice, certain animals which do not succumb to vaccinia are nevertheless rendered immune to subsequent challenge with a large dose of virus. The ratio between the "lethal" and "immunizing" titers differs with different strains of virus. Following subcutaneous inoculation of virus, immunity is produced but only after insertion of a greater amount than after intracerebral insertion.

SULKIN, S. E. (1945.) **The effect of environmental temperature on experimental influenza in mice.**—*J. Immunol.* **51.** 291–300. **1068**

Experiments on mice were carried out with the PR8 strain having a 50% lethal end-point of $10^{-6\cdot5}$. Batches of mice were given intranasally three average lethal doses of virus and were divided into three equal groups which were kept at 60°F. (cold room temperature), 70°–78°F. (normal room temperature) and 95°F. (hot room temperature) respectively. The results were analysed in terms of percentage mortality and the extent of lesions on the sixth day after inoculation. No significant difference was noted in regard to the percentage death rate, but in respect of pulmonary involvement the difference between cold room (65·9 ± 28·9%) and hot room (41·1 ± 31·3%) was highly significant ($P = 0\cdot0005$) while the corresponding difference between hot room and room temperature was probably significant ($P = 0\cdot028$).

From this, it is concluded that environmental temperature has a definite effect on the infectivity of virus for Swiss mice, animals at a higher temperature showing less pulmonary involvement than those exposed to lower temperatures.—R. E. GLOVER.

BEVERIDGE, W. I. B. (1944.) **The effect of the temperature of preliminary incubation on susceptibility of the chick embryo to influenza viruses.**—*Aust. J. exp. Biol. med. Sci.* **22.** 169–172. **1069**

Eggs incubated at 36·6°–37·8°C. (98°–100°F.) before allantoic inoculation with influenza virus A or B gave about twice the yield of allantoic fluid of those incubated at 39°C. (102°F.) and were uniformly infected, whereas a proportion of those incubated at the higher temperature were not infected. The higher temperature favoured bad scarring when chorio-allantoic inoculation was used. Susceptibility to influenza A or B virus inoculated into the amniotic cavity or yolk sac or to ectromelia virus inoculated onto the chorio-allantois was not affected by the variation in temperature.—L. HART.

WEIR, J. M. (1944.) **Susceptibility of the cane rat (*Zygodontomys*) and of the bush rat (*Proechimys*) to influenza viruses.**—*J. infect. Dis.* **74.** 121–130. **1070**

The object of these experiments was to find a suitable animal to supplement the ferret and the hamster for isolation and identification of influenza virus from human material. The two rodents concerned were available during studies of jungle yellow fever in Colombia. It was shown that the cane rat was susceptible to mouse-adapted influenza A virus, the virus being most plentiful in the turbinates. Death with pneumonic involvement was rare, in contrast to the findings in Swiss mice. Three samples of throat washings from known human cases were found to produce the disease in the cane rat, and by serum neutralization tests the virus was found to be type A. Type B mouse-adapted virus was also found to be infective for the cane rat, and sub-passages from the rat were infective for Swiss mice, though the lesions produced in the rat were not as severe as with type A. It is suggested that the cane rat is not as susceptible as the ferret but is comparable with the Swiss mouse.

Similar experiments with the bush rat suggested that it had low susceptibility to A virus from the mouse, although it was found that virus could be recovered from several human samples by passage. The antibody titre developed in the two animals in response to infection was comparable to that observed in man and the ferret.—J. B. BROOKSBY.

BURNET, F. M., & STONE, J. D. (1945.) **Further studies on the O-D change in influenza virus A.**—*Aust. J. exp. Biol. med. Sci.* **23.** 151–160. **1071**

In a previous paper BURNET & BULL [*V. B.* **15.** 44] showed that influenza A virus when isolated direct from the human throat in the amniotic cavity of the chick embryo differed in two characteristics from stock strains of influenza virus. It agglutinated fowl cells weakly or not at all, while agglutinating g. pig cells to normal titre, and failed to multiply in the allantoic passage. The present work was undertaken to find the best method of maintaining influenza A in the "O" phase.

An influenza virus A strain has been maintained in the "O" phase through 24 amniotic passages with no change in the essential characteristics. Certain precautions are necessary and the original should be consulted.—L. HART.

BURNET, F. M., & STONE, J. D. (1945.) **A method for the isolation of influenza virus from throat washings without filtration.**—*Aust. J. exp. Biol. med. Sci.* **23.** 161–163. **1072**

Penicillin to give a concentration of 100 Oxford units per ml. is added to throat washings and the mixture is passed through sterile filter paper. In experiments on 13-day-old chick embryos, 1 ml. of 5% sodium sulphadiazine solution was inoculated into the amniotic cavity immediately before inoculation with an equal volume of the throat washing. The quantitative recovery of small amounts of "O" influenza virus A added to the unfiltered throat washings of normal persons was demonstrated, as was the recovery of virus from the nasal secretion of experimentally infected ferrets.—L. HART.

GILYARD, R. T. (1945.) **A clinical study of Venezuelan virus equine encephalomyelitis in Trinidad, B.W.I.**—*J. Amer. vet. med. Ass.* **106.** 267–277. **1073**

This article is a review with particular reference to the 1943–44 outbreak in Trinidad. The disease had hitherto been recognized in Colombia and Venezuela as an entity distinct from the Eastern and Western strains of E.E. The virus is believed to have reached Trinidad from the mainland with the anophelene mosquito, *Aëdes taeniorhynchus*, which has the necessary range of flight, although it is not a particularly equinophilic species. Once the disease had been established, it was undoubtedly spread by the culicine mosquito, *Mansonia titillans*, which is abundant and markedly equinophilic.

The first animals affected were donkeys, but there were ultimately 377 clinical cases with 314 deaths, the mortality being 91% in donkeys, 79% in horses and 60% in mules. The disease was confined to the area of the original outbreak, vaccination with chick embryo vaccine being practised round the area in the early stages and later extended to the entire colony. The period of incubation in a donkey experimentally infected was 48 hours, with death in six days. Generally, a rise in temperature of 2°–5°F. was followed in 48 hours by the appearance of the neurological symptoms similar to those recorded in Eastern and Western types of E.E. Transmission was by insect bite rather than contagion, though the latter was believed to occur. An ulcerative stomatitis was observed with sufficient regularity in mules and donkeys (50% of cases) to suggest that the virus may have been responsible. Ulcers 1–2 in. long were found on the tongue margins and buccal mucosa.

Failure of the vaccine to protect completely was observed in 13 animals, of which 11 died. The virus from these was found to be of Venezuelan type. The disease occurred about nine weeks after vaccination and it was thought that chick protein in the vaccine might have interfered with the immune response, or that the vaccine might have been administered by the subcutaneous route instead of intradermally. Cases of vaccinal activation of the disease in the incubation stage are also recorded. If vaccine is given in the febrile stage, death is hastened. Two fatal cases occurred in man and milder cases have been seen in laboratory workers, with the development of protective antibodies in the serum.—J. B. BROOKSBY.

HAMMON, W. McD., REEVES, W. C., & IRONS, J. V. (1944.) **Survey of the arthropod-borne virus encephalitides in Texas with particular reference to the Lower Rio Grande Valley in 1942.**—*Tex. Rep. Biol. Med.* **2.** 366–375. [Abst. in *Bull. Hyg., Lond.* **20.** 305–306, copied *verbatim*. Signed: D. J. BAUER.] **1074**

Entomological and serological surveys were carried out in the lower Rio Grande valley in 1942 with the object of discovering possible reservoirs of the viruses of St. Louis encephalitis and Eastern and Western equine encephalomyelitis. Mouse inoculation was used for detecting the presence of these viruses in 22,768 mosquitoes, representing 19 species. In no case was any virus isolated.

Sera from 82 birds and 53 mammals, taken in Cameron county, were tested for the presence of neutralizing antibodies to the three viruses. These were not found in animals born in 1942, but were present in 12 cases in animals born in 1941, when an epizootic had occurred. Three of 20 human sera showed antibodies to St. Louis virus.

Of 302 sera collected in other parts of Texas, antibodies to Eastern and Western equine encephalomyelitis were found only in horses, and in chickens hatched in 1941 (eight cases). Antibodies to St. Louis encephalitis were found in 7 per cent. of chickens hatched in 1941.

The absence of antibodies in chickens hatched after 1941 is probably connected with the absence of cases in man and horses and with the absence of virus in mosquitoes. The scarcity of *Culex tarsalis*, a known vector, may also have limited the spread of virus.

GINDIN, A. P. (1940.) Materialy k patogenezu infektsionnoĭ anemii loshadeĭ. **[Pathogenesis of equine infectious anaemia.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 143–144. **1075**

G. states that in all stages of the disease there is a breakdown in the iron metabolism of the patient. The causal virus is adsorbed on to the erythrocytes and carried to the spleen, whose normal function is thereby impaired; this results in the deposition of haemosiderin in the liver, lungs and kidneys.

In an artificially infected splenectomized foal, erythrocytes appeared to be destroyed in several unspecified organs. At such sites haemosiderin accumulated. This was especially marked in the lumen of the kidney tubules, but did not occur in the naturally infected horse suffering from E.I.A.—L. LEVENBOOK.

HURST, E. W., COOKE, B. T., & MELVIN, P. (1943.) **"Nervous distemper" in dogs. A pathological and experimental study, with some reference to demyelinating diseases in general.**—*Aust. J. exp. Biol. med. Sci.* **21.** 115–126. **1076**

A virus identical in behaviour with that of the distemper virus was isolated from the brains of dogs suffering clinically from "nervour distemper", and was neutralized by distemper antiserum. For these and other reasons the conclusion is reached that the cause of "nervous distemper" is the true distemper virus. Lesions in the brains of naturally and artificially infected animals were identical, being characterized by demyelination and a tendency to localize in the white

matter of the folia of the cerebellum, the periphery of the brain stem and superficial regions around the interpeduncular fossa. The suggestion is advanced that the reason for the occurrence of nervous lesions some weeks after the initial acute systemic phase is due either to the low concentration of antibodies or to their failure to penetrate the blood-brain barrier. It is pointed out that in equine encephalomyelitis the nervous system may be infected successfully in animals recovered from the systemic infection.—D. C. BLOOD.

KHUEN, E. C. (1945.) **A clinical report on the use of distemperoid virus.**—*N. Amer. Vet.* **26.** 546. **1077**

150 pups were vaccinated with 15 mg. of Green's dried modified distemper virus [see *V. B.* **14.** 270]. The results on the 119 animals which could be followed up proved satisfactory.—M. L. LEVI.

GARD, S. (1945.) **Distribution of poliomyelitis virus in the intestines of normal mice.**—*Acta med. scand.* **120.** 40–52. [In English.] [Abst. in *Bull. Hyg., Lond.* **20.** 365, slightly amended.] **1078**

The concentration of mouse poliomyelitis virus in the ingesta and the intestinal wall of healthy mice was determined by titration in mice. The viral activity of the intestinal contents exceeded that of the wall about ten times. When the special conditions of the experiments were considered it could be concluded that at most a few per cent. of the total virus content might be present in the interior of intestinal cells. This indicates that the multiplication of virus might occur in the ingesta, presumably in a micro-organism serving as a host. The virus, when present at all, was almost constantly found also in the uppermost part of the small intestines.

DE BURGH, P., JACKSON, A. V., & WILLIAMS, S. E. (1945.) **Spontaneous infection of laboratory mice with a psittacosis-like organism.**—*Aust. J. exp. Biol. med. Sci.* **23.** 107–110. **1079**

A virus which could not be distinguished from psittacosis virus caused a naturally occurring infection in mice. The mice which were first infected were on a poor plane of nutrition and subjected to irradiation by X-rays. The finding emphasizes the danger of repeated mouse lung passages.—L. HART.

DELBRÜCK, M. (1945.) **Interference between bacterial viruses. III. The mutual exclusion effect and the depressor effect.**—*J. Bact.* **50.** 151–170. [Author's summary copied *verbatim.*] [For previous parts, see *V. B.* **14.** 122, absts. 789 and 790.] **1080**

Bacteria which are simultaneously infected with viruses alpha and delta are lysed after a time interval of 13 to 17 minutes. This is the same time interval as that for unmixed infection by either virus. Every mixedly infected bacterium liberates either virus alpha or virus delta, none both (fewer than 1 per cent of the bacteria). This is called the "mutual exclusion effect". For equal multiplicity of infection with both viruses, about one third of the bacteria liberate virus alpha, two thirds liberate virus delta. A group of viruses which attack one host can be arranged in a series according to their exclusion power.

In mixed infections with alpha and delta the average yield of virus from a bacterium is very much less than in unmixed infection. The excluded virus depresses the yield of the successful virus. The depressor action diminishes gradually when the time between the addition of the two viruses is increased. There is a critical time interval beyond which there is no depressor action. The length of this time interval depends on the nature of the first virus and is independent of the nature of the virus which acts as depressor.

Antibacterial serum added in high concentration before the second virus prevents adsorption of the second virus. If added in low concentration the antibacterial serum does not prevent adsorption of the second virus but diminishes its interfering action.

Antivirus serum, added after adsorption of a virus, diminishes its depressor action.

A working hypothesis, the "penetration hypothesis", is elaborated. The hypothesis assumes: (a) that the penetration of the first virus into the cell makes the cell membrane impermeable to any other virus; (b) that each virus has a characteristic time of penetration and that the change in permeability occurs at the end of this time interval uniformly for the entire cell membrane; and (c) that dividing cells act as a unit up to the moment of separation.

The depressor effect is interpreted as competition for a common substrate between the virus which penetrated into the cell and the excluded virus.

DELBRÜCK, M. (1945.) **The burst size distribution in the growth of bacterial viruses (bacteriophages).**—*J. Bact.* **50.** 131–135. [Author's summary copied *verbatim.*] **1081**

The burst size distribution for the growth of virus alpha on strain "B" of *Escherichia coli* is determined for single infection. The burst sizes range from below 20 to over 1,000, with a broad maximum around 180. Comparison with the distribution of bacterial sizes in the same culture shows that the wide distribution of burst sizes cannot be accounted for by variations in the size of the bacteria alone. Multiple infection with viru-alpha gives the same distribution of burst sizes as single infection. Single and multiple infection with virus delta growing on the same host gives similar distributions, though with higher average burst sizes.

DELBRÜCK, M. (1945.) **Effects of specific antisera on the growth of bacterial viruses (bacteriophages).**—*J. Bact.* **50.** 137–150. [Author's summary copied *verbatim.*] **1082**

Exposure of virus-infected bacteria to strong antivirus serum fails to affect the course of virus growth. The survivors of a suspension of gamma virus, more than 99 per cent of which is inactivated, are adsorbed as rapidly as are untreated gamma particles. There is also no detectable difference between the growth rates of these serum survivors and of untreated virus particles. Gamma virus inactivated by antiserum fails to interfere with the growth of untreated gamma virus or of alpha virus. Adsorption of virus is strongly inhibited if the bacteria are pretreated for a few minutes with antibacterial serum. This effect can be utilized for rapid titrations of antibacterial serum. Bacteria treated with high dilutions of antibacterial serum will adsorb virus, but there is a slight delay in the liberation of virus from these bacteria.

BEVERIDGE, W. I. B. (1942.) **Investigations on contagious ophthalmia of sheep, with special attention to the epidemiology of infection by *Rickettsiae conjunctivae*.**—*Aust. vet. J.* **18.** 155–164. **1083**

B. describes the clinical symptoms of contagious ophthalmia in sheep and their breed, species and age susceptibility. *R. conjunctivae* was found in smears made from the eyes of affected sheep. The disease was transmitted readily by instilling tears from affected sheep on to the conjunctiva of healthy sheep. Tears from carrier animals also set up the disease in susceptible sheep and it occurred after contact between carriers and susceptible sheep. Occasionally carriers suffered clinical relapses. Attempts to isolate and cultivate the rickettsia were unsuccessful.

In the early acute phase of the disease most of the organisms are intra-cellular. When clinical recovery occurs they are larger, irregular and mostly extra-cellular. B. refers to these microscopic findings as phase I and phase II respectively. Only phase II organisms can be found in sub-clinical infections and in carriers. In about half the cases, organisms were present in one or both eyes 100 days after the initial infection.

Three strains of the disease were tested for cross-immunity. All the sheep tested were resistant and recovered sheep were immune to reinfection for at least 100 days.

B. states that the high summer incidence suggests transmission by flies under Australian conditions. The disease can persist in a closed population but is usually recognized only when there is an epidemic.

Treatment with zinc sulphate solutions of varying strengths did not prevent the spread or alter the clinical course of the disease. Rickettsia disappeared from the eyes of clinical cases and carriers after one or more treatments with 30% or 60% zinc sulphate solution. Such cases appeared to be more subject to clinical relapses and the duration of immunity was not always as long as that in sheep recovering normally.—J. D. S.

SMITH, D. J. W. (1942.) **Studies in the epidemiology of Q fever. 10. The transmission of Q fever by the tick *Ixodes holocyclus* (with notes on tick-paralysis in bandicoots). 11. Experimental infection of the ticks *Haemaphysalis bispinosa* and *Ornithodorus sp.* with *Rickettsia burneti*.—*Aust. J. exp. Biol. med. Sci.* 20.** 213–217 & 295–296. **1084**

10. *I. holocyclus* is a potential vector of "Q" fever. Larval, nymphal and adult ticks were infected experimentally by feeding on infected laboratory animals. The rickettsia was passed from larvae to nymphs and from nymphs to adults but did not pass through the egg to the next generation. Bandicoots from tick-free areas were found to be susceptible to "tick paralysis". [*I. holocyclus* is a common cause of paralysis, often fatal, in domestic animals and even in man, and in tick-infested areas, the bandicoot which is the normal host of the tick appears to be resistant to paralysis.]

11. *H. bispinosa* became infected with "Q" fever by feeding on infected animals in its larval, nymphal or adult female stages, and infection was passed from larva to nymph and from nymph to adult. Rickettsia were demonstrated in the ticks and infection was transmitted to experimental hosts when infected ticks fed on them.

O. gurneyi nymphs and adults became infected by feeding on febrile g. pigs infected with "Q" fever. Inoculation of an emulsion of infected ticks produced infection in experimental hosts. Feeding by infected ticks failed to transmit the rickettsia, probably because *O. gurneyi* engorges rapidly (25–75 min.) and in this short time it is unlikely that the bite-wound would become contaminated with infected material from the hind-gut.—H. McL. GORDON.

BEST, R. J., & LUGG, J. W. H. (1944.) **Partial composition of tobacco mosaic virus protein: the amide, tyrosine, tryptophane, cystine (plus cysteine) and methionine contents.—*Aust. J. exp. Biol. med. Sci.* 22.** 247–250. [Authors' summary copied *verbatim*.] **1085**

Partial analysis have been made of the tobacco mosaic virus protein. Of the protein nitrogen (the purified protein contained 16·60 p.c. N), 8·05 p.c. was estimated to occur as amide, 1·72 p.c. as tyrosine, 1·74 p.c. as tryptophane 0·53 p.c. as cyst(e)ine and 0·00 p.c. as methionine. Expressed as a percentage by weight of the protein, the corresponding values are: 1·62 p.c. ammonia (amide), 3·68 p.c. tyrosine, 2·10 p.c. tryptophane, 0·75 p.c. cyst(e)ine, 0·00 p.c. methionine. No sulphate-S could be detected.

See also abst. **1087** (E.E. diagnosis), **1107**, **1108** (virus tumours of mice), **1109**, **1110** (fowl viruses), **1113** (sheep viruses), **1118**, **1119** (congenital defects from rubella in pregnancy), **1154** (bacteriophage), **1204**, **1205** (virus inactivation),

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SINGER, E. (1945.) **Intracellular oxidases in infection.—*Aust. J. exp. Biol. med. Sci.* 23.** 41–46. **1086**

Histochemical methods were used to demonstrate the cellular oxidases in material from infected animals and man and from toxaemic animals. Marked changes in the intensity and distribution of the oxidases were observed in the leucocytes and organ cells. Polymorphonuclear leucocytes, heart muscle, and adrenal cortex were affected earlier and more severely than other organs. S. believes that these observations support the theory of the oxidative detoxication of toxins.—J. D. S.

PEARSON, H. E. (1944.) **Attempts to obtain specific agglutination of mixtures of collodion particles or bacterial cells with virus and antiviral serum.—*J. Immunol.* 49.** 117–122. **1087**

P. was unable to repeat the work of GOODNER [*V. B.* **12.** 282] and ROBERTS *et al.* [*V. B.* **12.** 416] on the agglutination of suspensions of collodion particles or bacterial cells in the presence of mixtures of virus and antibody. Influenza virus cultivated in eggs was tested against human and ferret convalescent sera and poliomyelitis virus from mouse brain was tested against serum from monkeys. Neither by adhering to the technique of GOODNER, nor by introducing considerable variation in the method of the collodion-particle test was P. able to record positive results. The bacterial agglutination method, using a suspension of *Chromobact. prodigiosum*, failed in tests using St. Louis encephalitis and Eastern equine encephalomyelitis viruses from mouse brain with the corresponding rabbit antisera. The adsorption of the viruses on the collodion particles or bacterial cells was controlled by infectivity tests.

—J. B. BROOKSBY.

CAVELTI, P. A. (1944.) **Studies on the technic of collodion agglutination. Influence of certain qualities of the collodion particles and of the proportions of antigen and collodion on the sensitivity and specificity of the reaction.—*J. Immunol.* 49.** 365–373. **1088**

C. studied the influence of several factors on the sensitivity and specificity of serological reactions with collodion particles. Provided the amount and concentration of antigen and collodion remained constant, there was a direct relationship between the titre of a given antiserum and the size of the particles, larger particles giving a higher titre than smaller ones. Freshly prepared collodion particles of uniform medium size ($0·5–4·0\mu$) appeared to be most desirable. It was found that the amount of collodion particles and the concentration of the antigen greatly influenced both the titre and the intensity of the agglutinations and that there existed definite optimal proportions of antigen and collodion particles.

All sera used were tested with plain collodion particles of the batch used for agglutination in order to

detect non-specific reactions. Such reactions were found only in serum dilutions up to about 1 : 40, but with unsuitable collodion suspensions, they often reached high titres. The collodion antigen was tested for non-specific reaction with saline and with normal serum, and fresh collodion particles were substituted as soon as any significant non-specific reaction appeared. —I. W. BROCKLEHURST.

HALBERT, S. P., SMOLENS, J., & MUDD, S. (1945.) **Reduced acute toxicity of antigens in saline-in-mineral-oil emulsion.**—*J. Immunol.* **51.** 39–43. **1089**

Suspensions of various antigens in water-in-mineral-oil emulsions stabilized by lanolin derivatives were found capable of increasing and prolonging the antibody response [see FREUND *et al.*—*V. B.* **15.** 47]. This is thought to be partly due to the slow release of the antigen as the mineral oil is phagocytosed by the body macrophages. Since this slowing of the rate of absorption might be expected to produce a decrease in the acute toxicity of various materials, experiments were carried out in mice to study the effect of adding to saline-in-mineral-oil emulsions the following :– Shiga neurotoxin, botulinus toxin, tetanus toxin, ricin and the somatic antigen of *Bacterium flexneri*. In all cases there was a marked reduction in the lethal toxicity. At certain dosage levels the survival period was definitely prolonged with the oily vehicle.

The oil emulsion seems to offer promise both by improving antigenicity and decreasing toxicity. A practical use is suggested in the preparation of immune antitoxic sera by giving very few injections in oil emulsions instead of numerous doses in gradually increasing amounts. [This method has been employed in France by RAMON for a long time—see *V. B.* **5.** 86.] Vaccine in saline-in-mineral-oil in human subjects has been under investigation for some time and has been well tolerated in 73 persons in a total of 100 injection sites.—S. J. GILBERT.

WINTER, L. B. (1945.) **The influence of duration of sensitization on anaphylaxis in the guinea-pig.**—*J. Physiol.* **104.** 71–83. **1090**

This paper extends W.'s earlier observations [see *V. B.* **15.** 11] to the quantitative study of the susceptibility of sensitized g. pigs to shock and the amount of antigen necessary for desensitization *in vivo*. The antigens concerned were horse serum, and albumin and globulin prepared by ammonium sulphate fractionation. It was found that the sensitivity of animals to any one of these antigens increased progressively at 20, 50 and 90 days after the sensitizing injection. In the serum-sensitized g. pigs, the amount of globulin necessary to abolish sensitivity, as judged by the reaction of the isolated uterus, increased at each test, but in globulin- or albumin-sensitized animals, the amount of antigen necessary was independent of that required to produce shock and even tended to show a slight decrease. When a very small amount of protein was given to highly sensitized animals, shock was more frequently produced when the injection was made into the portal blood than when it was made into the systemic circulation. It is concluded that the liver is highly important in sensitization.—J. B. BROOKSBY.

POMERAT, C. M., & ANIGSTEIN, L. (1945.) **Reticulo-endothelial immune serum (R.E.I.S.): I. Its action on spleen *in vitro*.**—*Tex. Rep. Biol. Med.* **3.** 122–141. [Abst. in *Bull. Hyg., Lond.* **20.** 588, copied *verbatim*.] **1091**

"The work of Soviet workers in the development of antireticular cytotoxic serum (ACS) has been used as a basis for the present study. The term reticulo-endothelial immune serum (R.E.I.S.) is suggested.

"Tissue cultures of chick, rat and guinea pig spleen from embryos and post-embryonic animals have been used in testing the action of homologous immune sera. These sera were obtained from rabbits immunized against spleen and bone marrow. At concentrations of at least 1 : 20 conspicuous inhibitory effects were observed. Such explants showed marked inhibition of outgrowth and clumping of migrating cells. The mechanism of these results perhaps can be interpreted as immunological phenomena.

"Evidence is being accumulated by tissue culture methods as to the stimulating effect of low concentrations of R.E.I.S.

"Emphasis is placed on the difference between using spleen and bone marrow directly as antigens and the use of immune serum prepared from them for therapeutic purposes."

JORPES, E., & THANING, T. (1945.) **Studies on the A-antigenic polysaccharide from the abomasus of cattle.**—*J. Immunol.* **51.** 215–219. **1092**

The composition of the A component of the Forssman antigen obtained from the abomasal mucous membrane of cattle by trypsin digestion followed by alcohol precipitation is complex, but the main part seems to be a neutral polysaccharide containing glucosamine.

The extract has a strong neutralizing effect (1 : 1,000,000) on α-iso-haemagglutinins and on anti-sheep and anti-human A-haemolytic amboceptors. It was also effective against β-agglutinins of A sera but to a less extent. After treatment with weak alkali or acetylation there was no appreciable decrease in the neutralizing effect, but destruction took place immediately on boiling with N/10 HCl.—R. E. GLOVER.

See also abstr. **1016** (strangles vaccine), **1019** (anthrax antiserum), **1023** (c.-f. test for TB.), **1027** (Japanese A-O vaccine for TB.), **1029** (Johne's bacillus antigen), **1033** (pasteurella vaccine), **1040** (brucella agglutinins in blood and milk), **1051** (aggln. test for foot rot), **1055**, **1056** (immunization against nagana), **1057** (dry *Trypanosoma* antigen), **1064** (foot and mouth disease antiserum), **1077** (distemper vaccination), **1116** (kidney antibodies), **1165** (staphylococcus anatoxin), **1204**, **1205** (ultraviolet-inactivated vaccines), **1207** (microfilarial antigen), **1220** (sera, vaccines allergens, and immunogens, vol. IV).

PARASITES IN RELATION TO DISEASE [GENERAL]

*EICHLER, W. (1943.) Hemmnisse der Aviparasitologie. [**Obstacles in avian parasitology.**]—*Zool. Anz.* **141.** 53–54. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 286.] **1093**

E. points out that in nearly every comprehensive list of avian parasites, the same bird host is frequently referred to under different names. For examples, he quotes the case where descriptions are given of two kinds of mites, one of which is said to be a parasite of *Gelochelidon nilotica* while the other is said to occur on *Sterna risoria*; in point of fact these two names refer to the same bird. Antiquated names such as these, now completely unrecognized by modern ornithologists, are still scattered through the literature. [It is most essential that authors refer to up-to-date nomenclature lists, as considerable confusion arises as a result of careless references based on what should be defunct lists.] —C. HORTON SMITH.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

SENIOR-WHITE, R. (1944.) **Some notes on the life-history of *Musca planiceps* Weid.**—*Indian J. vet. Sci.* **14.** 123–125. **1094**

These observations were made in Ceylon 22 years previously. Important features of this fly are that it is a continuous breeder throughout the year in fresh cow-dung, which is also the pabulum of the larvae which are hatched in the third instar, and that there is complete development in the same material. The adult females feed on the blood of cattle. Developmental details are recorded.—A. BHATTACHARYA.

MANI, M. S. (1941.) **Studies on Indian parasitic Hymenoptera. I.**—*Indian J. Ent.* **3.** 25–36. **1095**

M. describes 13 hymenopterous parasites, mostly of agricultural pests, of which 11 are new species, including *Ixodiphagus mysorensis* [validity doubtful], found parasitic on *Ornithodorus* ticks.—M. A. KHAN.

See also abstr. **1061** (vector of *Babesia ovis*), **1073** (of equine encephalomyelitis in Trinidad), **1074** (in Texas), **1083** (of rickettsial conjunctivitis of sheep in Australia), **1084** (of "Q" fever), **1218** (salmonella transmission by rat fleas), **1176-1186** (insecticides), **1206** (laboratory colony of lice), **1213** (ox warbles).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

BACIGALUPO, J., POU, M. C., CALZADA, S. V., & BERNINZONI, J. (1941.) La Limnaea viatrix d'Orbigny huésped intermediario de la Fasciola hepática en el Uruguay. [*Limnaea viatrix*, **intermediary host of *Fasciola hepatica* in Uruguay.**]—*Sem. méd., B. Aires.* **48.** 1282–1283. **1096**

L. viatrix found in and around Montevideo were found to be 12·07% infected with larval stages of *F. hepatica*. It is considered that the species represents the usual intermediate host in that area.—J. H.

BHALERAO, G. D. (1943.) **The cercarial fauna of the irrigated tract of the Nizam's Dominions, with suggestions regarding their relationship to the trematode parasites in man and in domestic and other animals.**—*Indian J. vet. Sci.* **13.** 294–296. **1097**

As a result of investigations carried out during the early and late parts of the monsoon, B. records the occurrence in aquatic snails of the cercariae of schistosomes, two amphistomes, three echinostomes, one liver fluke and one monostome, parasites of domestic animals. Instances of double cercarial infections of molluscs are reported.—H. D. SRIVASTAVA.

NOSIK, A. F. (1940.) Ekhinokokkoz kishechnika sobak. [*Echinococcus granulosus* **in the intestines of dogs.**]—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 210–214. **1098**

This is a general discussion, involving little new work. The viability of scolices in different solutions such as saline, glycerin, Dakin's solution, methylene blue etc., is described. The test chosen to determine viability of scolices was to warm them to 38°–39°C., when the live scolices everted.

The various methods for the diagnosis of infestation in dogs are discussed and compared; the reactions of the infested host are also described in some detail. 100% positive diagnoses were made either by the method of washing and successive decanting of fresh faeces, or from fresh faecal smears following the administration of an active anthelmintic. All other methods tried gave positive results in 45–95% of cases only.

Trials of various anthelmintics showed that arecoline hydrobromide and filicin were the most effective. —L. LEVENBOOK.

CLAPHAM, P. A. (1945.) **On some characters of the genus *Trichuris* and a description of *T. parvispicularis* n.sp. from a cane rat.**—*J. Helminth.* **21.** 85–89. **1099**

C. lists the characters which have previously been used to distinguish the various members of the genus *Trichuris*. Additional characters of the head and oesophageal region are described for *T. ovis* and *T. trichiura*. —T. E. GIBSON.

MORGAN, D. O., & SLOAN, J. E. N. (1944.) **Some observations on helminths in Scottish hill sheep.**—*Vet. Rec.* **56.** 436–437. Discussion p. 437. **1100**

A survey involving examinations of faeces from 719 sheep and lambs in Ettrich Valley gave counts of more than 1,000 eggs per gramme in 25% of lambs and yearlings, but in only 10% of older sheep. Since *Haemonchus contortus* (a prolific egg-layer) was never found in large numbers in the few animals which died, the authors suggest that a figure of 1,000 nematode e.p.g. may be assumed to be pathogenic in these sheep. —G. B. S. HEATH.

KRASTIN, N. I. (1940.) Khiostrongilez svinei. [*Hyostrongylus rubidus* **in pigs.**]—*Rabot. III Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works*]. pp. 215–222. **1101**

Measurement of a large number of eggs from infected pigs from all over the Soviet Union gave an average size of $76\mu \times 36\mu$ in all cases with a length to breadth ratio equal to, or greater than, 2. It is claimed that this fact permits of the rapid identification of *H. rubidus* eggs in faecal smears from pigs with a mixed infestation. The complete life-cycle *in vivo* occupied 20–21 days. Epizoological studies showed that pigs over one year of age were the most susceptible to infection. The youngest piglet found to be naturally infected was 58 days old. There was no difference in the degree of infection in pigs kept in the sty, or allowed access to pasture, etc.

In tests of a series of anthelmintics administered by a variety of methods, 1 : 1,000 iodine solution given by stomach tube at a rate of 0·002–0·003 g. per kg. live weight was the most effective.—L. LEVENBOOK.

TAKHISTOV, B. A. (1940.) Diktiokaulez severnovo olenya v usloviyakh Kol'skovo poluostrova. [*Dictyocaulus* **infestation in reindeer in the Kol'skii Peninsula.**]—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] p. 209. **1102**

T. gives a summarized account of the life-history of *D. hadweni*. Adult and half-grown reindeer are infected, mostly during the summer months. Larvae are then common in the faeces, and become infective in 3–5 days. Larvae can remain viable in the faeces for one and a half months.

Since infection is largely due to the reindeer grazing continuously on the same pasture for 3–4 days or more, it may be avoided simply by changing the pastures more frequently.—L. LEVENBOOK.

See also abstr. **1113** (blood picture of parasitized sheep), **1150** (lungworms in goats), **1207** (*Dirofilaria immitis*), **1187-1191** (anthelmintics).

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

DRIEUX, H., POISSON, J., & VASSEUR, M. (1944.) Lésions cutanées de neurofibromatose chez un bovidé. **[Cutaneous lesions of neurofibroma in the bovine.]** —*Bull. Acad. vét. Fr.* **17.** 183–188. **1103**

Multiple tumours were found at the spinal roots of the intercostal nerves in a cow at an abattoir and closer examination revealed the presence of three subcutaneous tumours of similar appearance, one in the right flank, and two behind the left shoulder. The three skin tumours were whitish, firm and elastic and were freely moveable. There was no involvement of the acoustic nerves, as is frequently the case in human beings.

Histological examination showed three zones, namely, a diffuse network of fibrils, dense intermingled bundles of cells and many pseudo-tactile corpuscles. The diffuse tissue was present in all the growths, but the dense tangled bundles and the corpuscular elements were not found together in the same tumour, *i.e.*, certain growths showed diffuse tissue and dense fasciculi, whilst others were composed of diffuse tissue and corpuscles.

The limiting capsule was composed of perineural tissue, surrounding, but not an integral part of the tumour proper, which appeared to be composed of Schwann cells. The effects of trichrome staining on the various constituents are described, the loose tissue showing the transformation from a pre-collagenous to a collagenous state, and the corpuscles staining a dark violet in the centre, merging with green at the periphery.

The authors state that this is the first known case in which skin tumours arising on the course of cutaneous nerves have occurred together with tumours of nerve trunks in the bovine and they conclude that the condition is homologous with von Recklinghausen's disease in man.—JOHN G. CAMPBELL.

CHELLE, P., & LOMBARD, C. (1944.) Epithelioma mélanique chez les bovidés. **[Melanotic epithelioma in bovines.]**—*Bull. Acad. vét. Fr.* **17.** 302–305. **1104**

The authors remark on the apparent rareness of melanotic epithelioma in bovines, stating that only one case has previously been recorded, a brief description of which is now given. Proceeding to their own case, they state that the condition arose in the interdigital cleft of the left hind foot, at the site of an injury received, according to the owner, about a fortnight before.

When examined, the animal was in poor condition with an offensive discharging wound in the interdigital cleft. Examination P.M. revealed neoplastic tissue spreading up subcutaneously from the region of the wound towards the popliteal gland, which was as large as an orange and showed on section a mottled grey, black and white surface. Metastases were found in the testicles, kidneys, heart, lungs and pleura, but not in the liver or spleen. The bronchial and mediastinal lymph nodes were greatly enlarged and completely black. The pleural cavity contained a large amount of haemorrhagic exudate.

Histologically the skin tumours were composed of two cell types, polyhedral epithelial cells and branching cells, both with brown or black granules in the cytoplasm. In the lungs the epithelial type predominated and in parts there were areas of necrobiosis. The connective tissue and muscles of the limb were extensively infiltrated by the neoplastic cells. The authors draw attention to two cases reported in dogs, both of which appeared to start in the digital region.

—JOHN G. CAMPBELL.

CHARTON, A., & MILIN, J. (1944.) Contribution à l'étude des leucoses du chien: deux cas de leucose leucémique lymphoïde. **[The study of canine leucosis: two cases of leucaemic lymphoid leucosis.]** —*Bull. Acad. vét. Fr.* **17.** 91–96. [Translated from the French.] **1105**

Following a brief survey of reported cases, the authors state that in the two years 1942–44, at the medical clinic at Alfort, 14 cases of leucosis were observed in 3,615 dogs examined (0·387%). During 1937–39, however, they only observed 15 cases in 13,382 dogs (0·112%). The respective frequencies of the disease before and after the recent war were 1·0 : 3·5. All breeds appear to be equally predisposed and dogs over four years of age were most frequently affected; the sex incidence was not significantly different. The disease occurs in lymphoid, myeloid and monocytic forms and true leucaemic types are rare. The authors record three cases, one myeloid and two lymphoid, the two latter being the subject of the report.

The symptoms noted include debility, capricious appetite, emaciation and bilateral enlargement of the superficial lymph nodes. Examination of the blood showed anaemia and a great increase in lymphoblasts. Differential counts of 19% in one case and 41% in the other were recorded before slaughter; the progress of the disease was rapid, lasting one month and three weeks respectively.

P.M. examination showed great enlargement of practically all the lymph nodes in the body and involvement of the liver, spleen and kidneys. Histological examination showed a diffuse infiltration and proliferation of cells of the lymphoid type, whilst the normal structure of the lymph nodes was completely obliterated.

—JOHN G. CAMPBELL.

MULLIGAN, R. M. (1945.) **Some endocrinologic considerations of canine neoplastic diseases.**—*Arch. Path.* **39.** 162–171. **1106**

This article consists of a review of the available literature on canine neoplastic disease, with special reference to that dealing with neoplasms of the endocrine glands and of the male and female reproductive organs.

M. suggests that future subjects for research in this branch of oncology might include an investigation into the syndrome of feminization of male dogs associated with testicular carcinoma, the relation between benign prostatic hypertrophy and castration, the association of ovarian cysts and solid tumours with changes in the female genital tract, the presence of hyperinsulinism with neoplasms of the pancreatic islets, the interpretation of the proliferation of interstitial testicular cells, the paucity of neoplasms reported for such organs as the pituitary, parathyroid, thymus and adrenal glands, the possible relationship of hormones with venereal sarcoma and the embryologic and hormonal aspects of mammary tumours.

There are 63 references, but M. does not mention JACKSON's important contribution to the study of canine neoplasms, especially venereal tumour [see *V. B.* **9.** 106].—JOHN G. CAMPBELL.

BITTNER, J. J., EVANS, C. A., & GREEN, R. G. (1945.) **Survival of the mammary tumor milk agent of mice.** —*Science.* **101.** 95–97. **1107**

In a preliminary report, the authors record that the active milk agent of mammary carcinoma may be carried for ten passages through mice which originally were free of the agent. This seems to indicate that the milk influence is continually produced within the transplanted tumour cells. Experiments on a small scale tended to show that the milk agent can survive 12 days

in the yolk sac of chick embryos, in the absence of living mouse cells.—I. W. BROCKLEHURST.

ROUS, P., & SMITH, W. E. (1945.) **The neoplastic potentialities of mouse embryo tissues. I. The findings with skin of C strain embryos transplanted to adult animals. II. Contributory experiments; results with the skin of C3H and Webster-Swiss embryos; general considerations.**—*J. exp. Med.* **81.** 597–620 & 621–646. **1108**

I. The skin of mouse embryos was implanted in the voluntary muscles of adults of the same inbred strain and continually exposed to the action of methylcholanthrene. This was carried out by injecting fragments of the skin of the embryo mouse, added to a solution of Scharlach R and methylcholanthrene in olive oil, into the thigh muscles. The implanted epithelial cells proliferated to form cysts, the lining of which was continually exposed to the action of the carcinogenic agent. The purpose of the Scharlach R was to attract epidermal cells and cause them to proliferate and enclose the oil globules containing the carcinogen.

In less than four weeks neoplastic changes occurred in the implanted epidermis, papillomas and carcinomas resembling those arising from adult skin being formed. Usually several neoplasms developed at the site of injection and sometimes both sarcomas and carcinomas were present. A proportion of the induced neoplasms grew satisfactorily when transplanted into mice of the same inbred strain from which the embryo skin was obtained.

II. In order to see whether chemically induced epidermal tumours arise because of previous localization of a tumour-producing agent (*e.g.*, a virus), skin areas in mice and rabbits were kept inflamed for some weeks, allowed to return to normal and subjected to methylcholanthrene. It was considered that continued inflammation would favour the localization in the areas of a blood-borne agent. The tumour incidence in treated skin areas was no greater than in control areas not subjected to previous inflammatory changes.

Continuing the studies reported in I, it was found that tumours of many kinds can be induced by transplantation, together with methylcholanthrene, of organs of embryos of mice of C strain. The tissues which were successful included stomach, lung, ovary and bile passages, but the stomach growths alone were subjected to extensive study. These tumours develop rapidly when embryo stomach is implanted into the thigh muscles and are readily transplanted to other animals.

The authors engage in an interesting discussion of the possible part played by viruses and by the "milk factor" in the formation of tumours.—E. G. WHITE.

BARBER, C. W. (1943.) **The effect of the rearing environment upon the incidence of the avian leucosis complex.**—*Rep. N.Y. St. vet. Coll., 1941–42.* pp. 73–79. [See also *V. B.* **14.** 61.] **1109**

During previous work on fowl paralysis, Barber noticed that the incidence of the disease in the control birds was often equal to the incidence in the experimental group. Several groups of pullets purchased as ready to lay, showed only a 3% incidence in their first laying year, but an average of 40% of their offspring reared on the station developed the condition, equalling the incidence (38%) in the experimental birds.

Three groups of birds were therefore reared away from the station for 19–22 weeks and the incidence of the complex was found to be nil, 6·3 and 12·5% respectively, in contrast with two non-isolated control groups which showed an incidence of 23 and 51%.

Next, birds were isolated for periods of four, ten, 19 and 22 weeks and subsequently 46, 32, 13 and 10% of these developed the complex. On the other hand there was a 64% incidence among birds reared entirely at the station. Birds that were raised in isolation developed the disease much later in life than those reared at the station.—JOHN G. CAMPBELL.

HUTT, F. B., COLE, R. K., & BRUCKNER, J. H. (1945.) **A test of fowls bred for resistance to lymphomatosis.**—*Poult. Sci.* **24.** 564–571. **1110**

For some years the authors attempted to establish strains of White Leghorns resistant to disease and particularly lymphomatosis. It was decided to test the sixth selected generation of these strains against stock supplied by four leading White Leghorn breeders, none of whom had made any attempt to breed for such resistance.

Samples of 100 female chicks or more from these four breeders were obtained at hatching and mixed with birds of the C resistant, the K resistant and the C susceptible strains. Details concerning these strains have been given in earlier reports by HUTT *et al.* (1939–41). The chicks from ten weekly hatches were divided, those from the odd-numbered hatches being more severely exposed for the first two weeks to the agents causing lymphomatosis than were those from the even-numbered hatches. At two weeks of age, all chicks went to the rearing range where they could mix at random. At about five months of age, they were housed in winter quarters.

Deaths from neoplasms (over 90% of which were cases of lymphomatosis) in birds from 6 weeks to 500 days of age were considerably fewer in both the C and the K resistant lines than in any of the four unselected stocks. Mortality from all causes was considerably less in the K line than in any of the four and lower in the C line than in three of them. Egg production was significantly higher in both the C and K resistant lines than in any of the four introduced stocks. Deaths from neoplasms were from 2·3–9·0 times as frequent (varying with strain and severity of exposure) in the C susceptible line as in the C and K resistant lines.

It was recognized that a strain resistant to one disease had little value if it had never been exposed to the other conditions which few large flocks can escape. For this reason, as far as this experiment was concerned, sanitation was almost entirely dispensed with; houses were cleaned, but not disinfected and there was no attempt to brood or rear the chicks in isolation.

The authors therefore seem justified in their claim that the sixth generation of the two lines bred for resistance to disease was superior to the four different unselected stocks in egg production, viability or particularly in resistance to lymphomatosis.—J. D. BLAXLAND.

DISEASES, GENERAL

KEARNEY, W., & ADAMS, C. B. (1945.) **Infectious diseases of poultry.**—*J. Dep. Agric., Eire.* **42.** 65–75. **1111**

This article, which describes the commoner infectious diseases and gives advice as to their prevention and control, was occasioned by the expansion taking place in the poultry industry of Eire. A table is given showing the incidence of these diseases as observed in specimens sent to the Veterinary College during the years 1935–44. The conditions dealt with include coccidiosis, pullorum disease, tuberculosis, worm infestations, blackhead, leucosis and fowl typhoid.

Coccidiosis appears to have been the most prevalent disease during this period, followed by pullorum disease. Non-specific disorders accounted for 50–60% of the total mortality every year.—J. D. BLAXLAND.

FRANKLIN, M. C., & MACGREGOR, C. H. (1944.) **An experimental investigation of the cause of death of merino rams after long journeys by rail.**—*Aust. vet. J.* **20.** 328–331. **1112**

Fasting experiments are described which were carried out to simulate conditions experienced during transportation over long distances. They showed that short periods of starvation markedly depressed food consumption for a short period following the fast, so that during an extended journey fasting effects may become cumulative. Fasting rams for 4–6 days resulted in a decline in the level of serum calcium, in one instance a decline of 43% being recorded. Consumption of linseed nuts, a by-product of the linseed oil industry, by fasted rams resulted in several deaths, whereas rams which were not fasted consumed larger quantities without ill-effects. These losses are attributed to hydrocyanic acid poisoning [see also abst. **1146**].

Generous supplementary feeding with good roughage-concentrate mixtures or good quality hay for ten days prior to transportation is recommended to minimize risk from fasting during transit.—R. L. REID.

HOLMAN, H. H. (1945.) **Studies on the haematology of sheep. V. A survey of blood pictures in sheep diseases.**—*J. comp. Path.* **55.** 229–242. [For parts II–IV, see *V. B.* **16.** 113.] **1113**

The blood picture in a number of sheep diseases is described, information being summarized in the form of a table. In lamb dysentery, with presumably *Clostridium welchii* Type B toxin predominating, there was a leucopenia without haemoconcentration. Leucopenia with haemoconcentration was seen in pulpy kidney disease due to *Clostridium welchii* Type D toxin. Infection with pyogenic organisms produced a typical neutrophilic reaction, which varied with the severity of the infection and was absent when the infection was localized. A variable neutrophilia occurred in Johne's disease and there was some tendency to hypochromic anaemia. With *Fusiformis necrophorus* infection variable neutrophilia was observed, with periods of leucocytosis. In this condition there was progressive oligocythaemia terminating in aplastic anaemia. In virus diseases there was no neutrophilic reaction and, except in scrapie, eosinophiles decreased during the infection and increased during the recovery phase. In scrapie, eosinopenia and a slight neutrophilic reaction were usual for a period of a few days before death. The records of the blood picture in parasitic conditions of badly infested sheep revealed after some weeks a state of neutrophilia. Eosinophiles decreased in numbers, but in some cases the decrease in numbers was preceded by a transient eosinophilia. Eosinophilia was a feature of the recovery phase. The anaemia present in *Haemonchus contortus* infestations was post-haemorrhagic and possibly macrocytic. Aplastic anaemia may be present in liver fluke disease, whilst with other species there is a tendency to hypochromic anaemia. In metabolic disorders no changes were observed, except in enzootic toxaemic jaundice, hypochromic anaemia, and hyperchromic anaemia. In severe yellowses [a photosensitization similar to the conditions sometimes called "facial eczema" in New Zealand and *geeldikkop* in South Africa], neutrophilia, eosinopenia and prolonged coagulation time were observed. There appears to be no general reaction to poisons.

Some comparisons are made with conditions in man and H. concludes that although analogies often exist between the diseases of man and sheep it is a dangerous expedient to argue from one species to another on the assumption that the blood picture is similar in the two species. It is contended that the use of the maximum admissible difference as a criterion renders the haemogram of value as a sensitive indication of both the course and severity of disease in sheep used for experiment.—T. E. GIBSON.

MAHAFFEY, L. W., BENNETTS, H. W., & FLOOD, A. F. (1942.) **Haemoglobinuria of calves in the South-West of Western Australia.**—*Aust. vet. J.* **18.** 205–208. **1114**

A disease affecting dairy calves of any breed, aged 3–10 weeks, is described. The incidence varies from year to year and the morbidity and mortality range from 5 to 80%. Cases occur from July to September (spring). The aetiology is unknown though the disease appears to be non-infectious and is neither an enterotoxaemia nor copper poisoning.

Clinically the syndrome is characterized by haemoglobinuria, a temperature of about 102°F., rapid pulse, weakness, unsteady gait, recumbency and icterus. Erythrocyte counts and haemoglobin values are low. The urine contains oxyhaemoglobin, albumin and bile pigments, but no cells or casts. The course extends over 1–7 days and spontaneous recoveries are not uncommon. At autopsy icterus is always present but may vary in intensity. Hepatic enlargement and splenomegaly are found. The kidneys are darker than normal. Petechial haemorrhages are always present in the thymus. Histologically the liver shows small areas of necrosis which are often centrilobular. Slight changes were observed in the convoluted tubules of the kidneys and there was proliferation of the interstitial connective tissue.—J. D. STEEL.

TRETHEWIE, E. R. (1945.) **Chemo-pathology of pneumonia in cats.**—*Aust. J. exp. Biol. med. Sci.* **28.** 47–51. **1115**

The isolated perfused, and the intact perfused, lung of the cat suffering from broncho-pneumonia liberated histamine. Most of the histamine passed into the lymphatic channels and the tracheal fluid, but a small amount appeared in the vessels. The normal lung of the cat also liberated deaminating enzyme into the perfusion fluid. In broncho-pneumonia the activity of the deaminating enzyme is increased and a substance is liberated which inhibits the cardiac depression produced by adenosine.—J. D. STEEL.

CAVELTI, P. A., & CAVELTI, E. S. (1945.) **Studies on the pathogenesis of glomerulonephritis. II. Production of glomerulonephritis in rats by means of autoantibodies to kidney. III. Clinical and pathologic aspects of the experimental glomerulonephritis produced in rats by means of autoantibodies to kidney.**—*Arch. Path.* **40.** 158–162 & 163–172. [Authors' summaries copied *verbatim*.] [For part I, see *V. B.* **15.** 399.] **1116**

II. Immunization of rats with mixtures of killed group A streptococci and emulsion of rat kidney leads to formation of antibodies to rat kidney. These antibodies to kidney act as a pathogenic agent and produce glomerulonephritis by means of their reaction with the kidney in vivo.

III. From the pathologic point of view the experimental glomerulonephritis produced in rats by means of autoantibodies to kidney consists essentially in exudative and diffuse proliferative processes involving the glomeruli, followed in severe forms by progressive obliteration of these structures. Clinically the lesion is manifested by proteinuria, cylindruria and microscopic hematuria. Other clinical symptoms observed

were edema, ascites, hypoproteinemia, lipemia, anemia, increase of blood urea and—as evidenced by cardiac hypertrophy—hypertension.

NASONOV, A. F. (1943.) Seborreya u loshadei. [**Seborrhoea in horses.**]—*Veterinariya, Moscow.* No. 7. pp. 11–12. **1117**

During the warmer months of the year, a few dozen horses of all ages, with animals in poor condition especially susceptible, were found to have a skin affection which was eventually diagnosed as the dry form of seborrhoea. No useful mention is made of the aetiology, but the external symptoms are described.

For treatment N. recommends scrubbing at intervals of 3–4 days with an emulsion of soft soap, creolin and warm water; 3–4 such treatments cause scaly material to separate from the skin. In untreated animals the disease may continue indefinitely although in a few cases, young and "healthy" animals not seriously affected and released from work, recovered without treatment.—L. LEVENBOOK.

MCALISTER, N. (1945.) **Rubella during pregnancy of the mother, with its sequelae of congenital defects in the child.**—*Med. J. Aust.* March 31st. 313–315. **1118**

The author records congenital defects in children of mothers who contracted rubella infections in early pregnancy and points out that other diseases in the mother may have a harmful effect on the developing embryo. The defects noted included ocular and cardiac defects, retarded growth, intolerance to atropine, high mortality rate, a dry, scaly eczematous skin condition and deafness.—D. C. BLOOD.

CARRUTHERS, D. G. (1945.) **Congenital deaf-mutism as a sequela of a rubella-like maternal infection during pregnancy.**—*Med. J. Aust.* March 31st. 315–320. **1119**

This is a record of clinical findings and one autopsy in 17 cases of deaf-mutism in children associated with a rubella-like infection of the mother in the early stages of pregnancy.—D. C. BLOOD.

NUTRITIONAL AND METABOLIC DISORDERS

SEN, K. C. (1945.) **Animal nutrition research in India.**—*Indian Fmg.* **6.** 156–160. **1120**

A popular review of animal nutrition research carried out in India in recent years. Subjects dealt with include the chemical composition of fodders and grasses, the digestibility and nutritive value of Indian feeding stuffs, the processing of cereal straws, feeding in relation to maintenance, growth, milk production and performance of work, malnutrition and deficiency diseases and mineral toxicosis.—A. W. ZUBAIRY.

KEHAR, N. D. (1944.) **Investigations on famine rations for livestock. I. *Munj* and molasses as famine rations.**—*Indian J. vet. Sci.* **14.** 40–48. **1121**

Attention is drawn to the current shortage of fodder for livestock in India. In non-irrigated areas, the scarcity becomes more acute when the annual rains fail. To keep animals alive during such famine periods, xerophyllous plants, like munj [cane sugar trash], which grow in abundance in arid and semi-arid areas, and factory wastes like molasses can be utilized without deleterious effects. Ordinarily, mature munj is not eaten by cattle, but when finely chopped, softened with water and then mixed with molasses a considerable quantity is consumed.

Long-term feeding experiments with munj mixed with molasses and supplemented by suitable concentrates to balance the ration, showed that adult animals gained in weight and remained in good health and that young animals maintained satisfactory growth with no untoward symptoms. Such feeding effects considerable economy, as compared with a standard ration.
—L. V. L. N. SASTRY.

MATHUR, N. L., & RAY, S. C. (1943.) **The chemical composition of star-grass (*Cynodon plectostachyum*) at different stages of growth and the nutritive value of mature star grass hay.**—*Indian J. vet. Sci.* **13.** 274–276. **1122**

With progressive maturity, the protein, calcium and phosphorus contents of star grass decline rapidly. Mature star grass hay, nevertheless, supplies fairly high amounts of digestible protein and energy and consequently can alone form a maintenance ration [some examples have a high HCN content].—V. N. MURTY.

SCHOUR, I., & MASSLER, M. (1945.) **The effects of dietary deficiencies upon the oral structures.**—*Physiol. Rev.* **25.** 442–482. **1123**

The oral tissues are peculiarly sensitive to dietary errors and nutritional deficiencies. The enamel an dentine of the teeth are permanent records of th animal's past nutritional history, and the alveolar bone gingivae and tongue quickly reflect the present internal nutritional status of the body. The effects of impaired nutrition vary with the particular oral or dental structure, its stages of development, the species of animal and the specific nutritional deficiency encountered.

Consideration is given to the effect upon all the oral structures of deficiencies and excesses of the vitamins A, B_1, riboflavin, nicotinic acid, pyridoxine, pantothenic acid, C, D and E. The relation of mineral deficiencies especially those of Ca, P, Fe and Mg, to the oral structures are also discussed and the effects of fluorine, carbohydrates and the physical characters of the food are reviewed in relation to tooth structure, development and decay. The rat has been the most useful animal for experimental studies of tooth development in relation to nutritional disturbances because of the continuous growth of its incisors; clinical observations on man have been responsible for most of the knowledge of the response of soft oral tissues, especially in connexion with vitamin B deficiencies.

Caries is a disease connected with food decomposition in the oral cavity rather than a nutritional disturbance although it may be aggravated by nutritional deficiencies. The physical character of the food is a significant factor in caries and periodontal disease. Routine examination of the oral structures offers an accurate index to the state of nutrition of the individual.
—A. EDEN.

MORRIS, M. L., NAKAMURA, F. I., & ATKINSIN, L. N. (1945.) **Proteins and vitamins in relation to nutritional deficiencies of mother's milk.**—*J. Amer. vet. med. Ass.* **106.** 336–342. **1124**

An account is given of a condition of failure to thrive in puppies reared from mothers who had been fed throughout pregnancy on certain proprietary commercial dog foods. The puppies appeared healthy for 1–4 weeks, then ceased to grow, became weak and dehydrated and finally died. The bitches were in normal health with no manifestation of parasitism or bacterial infection and had ample supplies of milk. Suspecting impaired quality of the milk, the authors determined the biological values of the proteins in the diet and though no obvious connexion between the food and the deaths of the puppies was revealed, it was shown

that the crude protein content of the food bore little relation to its biological value.

Blood studies on moribund puppies demonstrated a pronounced anaemia; puppies in the earlier stages of the disease improved in health after they were given subcutaneous injections of a commercial liver extract preparation. Experiments were carried out on the prophylactic use of this liver extract on pregnant bitches and following this, normal litters were successfully raised, but when the work was repeated a further batch of the same brand of liver extract was found to be ineffective. Satisfactory results accompanied by marked haematopoietic response followed bi-weekly injections into puppies of *Lactobacillus casei* factor (folic acid) or of vitamin B_6 (pyridoxine).—A. EDEN.

FITCH, L. W. N. (1944.) **A note on the storage of vitamin D by sheep following the subcutaneous administration of a single massive dose of calciferol.** —*Aust. vet. J.* **20.** 303–304. **1125**

Vitamin D was demonstrated in the blood of sheep slaughtered 2 and 2½ months after receiving respectively two or one massive doses of 20 mg. calciferol (equivalent to 800,000 I.U. vitamin D) subcutaneously. It was not detected in the blood of sheep which had received an oral dose of 45 ml. of cod liver oil weekly for nearly four months, nor in that of untreated controls.—R. L. REID.

FITCH, L. W. N., & EWER, T. K. (1944.) **The value of vitamin D and bone-flour in the prevention of rickets in sheep in New Zealand.**—*Aust. vet. J.* **20.** 220–226. **1126**

Three groups of nine Corriedale wether yearlings and three groups of four Corriedale ram yearlings were grazed on green Algerian oats for 4–5 months during winter. Group I, rams and wethers, received 30 ml. cod liver oil per head weekly; group II received 2 oz. of bone-flour weekly and group III served as unsupplemented controls. Almost all of the control animals and those receiving bone-flour developed rickets in moderate to severe degree, while the incidence and severity of rickets in the groups given cod liver oil was greatly reduced. The serum calcium levels of all wether groups were comparable but the serum phosphorus contents of both treated groups were significantly higher than of group III, and those of group I were significantly higher than of group II. The gain in weight of the group of wethers given cod liver oil during the experimental period was significantly greater than that of those fed bone-flour and of the untreated control groups.—R. L. REID.

See also abstr. **1112** (starvation in sheep), **1113** (blood picture in metabolic disorders of sheep), **1054** (vitamin requirements of bacteria).

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

KEHAR, N. D., MUKHERJEE, R., & SEN, K. C. (1943.) **Studies on protein metabolism. I. Investigations upon the endogenous nitrogen metabolism of cattle.** —*Indian J. vet. Sci.* **13.** 257–262. **1127**

KEHAR, N. D., MUKHERJEE, R., MURTY, V. V. S., & SEN, K. C. (1943.) **Studies on protein metabolism. II. The effect of muscular work on endogenous protein catabolism in cattle.**—*Ibid.* 263–266. **1128**

I. Endogenous urinary-N excretion was found to be 0·020 g. per kg. body weight in cattle fed a specially devised diet which was almost N-free; this value is lower than any recorded by previous workers. It is claimed that this low level of endogenous urinary-N can be obtained if the animals are fed for a sufficiently long time on a diet containing 0·15–0·20% nitrogen. Studies on N-partition and the nitrogen-sulphur ratio in urine showed that no breakdown of organized body tissues occurs with diets which are almost N-free or which are low in N and that the trend of endogenous nitrogen catabolism is independent of breed characteristics in the experimental subjects.

II. When bullocks kept on rations low in or almost free of N for 45–50 days, reach the endogenous level of urinary-N excretion and are made to do muscular work, there is no appreciable increase in the excretion of urinary nitrogen, urea, creatinine, creatine, total sulphur and sulphate sulphur, provided the animals receive extra energy-producing food during the work period. From these findings, the conclusion is drawn that the supply of additional energy-producing foods alone can safeguard against the breakdown of body tissues during work.—S. C. RAY.

SHARABRIN, I. G. (1940.) Klinicheskoe opredelenie arterial'novo krovyanovo davleniya u loshadei. **[Clinical determination of arterial blood pressure in horses.]**—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 20–26. **1129**

S. constructed three apparatuses for the determination of blood pressure in horses. Details of construction are not described but the photographic illustrations suggest a skilled adaptation for veterinary purposes of instruments already in use in human medicine. The tonometer is based on the palpatory principle for measuring the maximal blood pressure on the submaxillary artery, the oscillosphygmometer determines the maximal and minimal blood pressure on the caudal artery, and the sphygmotonograph registers graphically the maximal and minimal blood pressure, also the pulse character and heart beat.

Comparative measurements were made in 100 horses. With the tonograph the maximal blood pressure was 85–120 mm. Hg in 82·5% of tests, with the oscillosphygmometer it was 100–140 mm. Hg in 80% and with the sphygmotonograph it was 90–130 mm. Hg in 80%.

According to the last two methods minimal blood pressure was 50–70 mm. Hg. The fluctuation of blood pressure within 24 hours was found to be 14 mm. Blood pressure below 40 mm. should be regarded as symptomatic of a serious affection of the myocardium.

S. considers that of these instruments the sphygmotonograph is most accurate and most suitable for practical purposes. The oscillosphygmometer may be used for educational demonstrations.

For the purpose of functional diagnosis of cardiovascular disturbances a 10 min. trotting test was allowed, as well as the so-called apnoea test, in which the respiration was suppressed for 45–65 sec.—A. MOLDAWSKY.

ROBSCHEIT-ROBBINS, F. S., MILLER, L. L., & WHIPPLE, G. H. (1945.) **Maximal hemoglobin and plasma protein production under the stimulus of depletion.** —*J. exp. Med.* **82.** 311–316. [Authors' summary copied *verbatim.*] **1130**

The maximal output ceiling for hemoglobin in anemia due to blood loss is about 60 gm. per week—the dog receiving a rich protein diet plus high iron intake. Ferrous and ferric salts are equally effective. Iron intravenously plus a rich protein diet may push this level up to 90 to 100 gm. per week. Evidently iron absorption is a limiting factor.

Maximal output for hemoglobin plus plasma protein in doubly depleted dogs may reach 120 to 130 gm. per week and using intravenous iron may reach 140 to 160 gm. per week.

Maximal output for plasma protein alone in hypoproteinemia due to plasmapheresis reaches 60 to 70 gm. per week but *this is not the true ceiling*. Technically we cannot remove the new plasma protein as fast as it is formed and the hypoproteinemia is not maintained in the face of a rich protein diet intake. Furthermore the evidence points to the protein circulating pool contributing to the accretion of tissue protein in such dogs with a strong positive nitrogen balance and weight gain.

Maximal figures for *hemoglobin production* in anemia run close to 1 gm. hemoglobin per kilo per day. Maximal figures for new *hemoglobin plus plasma protein* production in anemia and hypoproteinemia using iron given intravenously, may reach 1·5 gm. blood protein per kilo per day. The actual maximal *plasma protein production* equals about 1 gm. per kilo per day but the true production ceiling cannot be reached by this technique, for reasons given above.

DAVIES, D. V. (1945.) **The cell content of synovial fluid.**—*J. Anat.* **79.** 66–73. **1131**

D. examined synovial fluid from a large series of cattle and sheep and from a small number of horses. The joints examined were the atlanto-occipital, the atlanto-axial, the tempero-mandibular and the costo-vertebral in the trunk and the astragalo-tibial, the elbow and the radio-campal in the limbs. Cell counts were made on a Fuchs-Rosenthal cerebrospinal fluid counting chamber in the case of the appendicular joints and on a Hawksley blood-counting chamber, using the 1/250 sq. mm. squares, in the case of the axial joints.

The cell content was found to be higher in axial joints than in limb joints, particularly in cattle and sheep. It is suggested that this may be due to variations in the amount and range of movement, *i.e.*, in the wear and tear within the joint. It may be significant that joints with highly viscous fluids and high cellular contents are relatively free from disease and degenerative changes. The effect of age and the plane of nutrition on the number of cells is discussed.

Monocytes and clasmatocytes were the predominant nuclear cells found, in synovial fluid of the axial and limb joints, lymphocytes being more numerous in the limb joints. The presence of more than a few polymorphonuclear cells was considered abnormal.

A few observations are recorded on injury to and infection of the synovial tissues.—C. W. OTTAWAY.

HUEPER, W. C. (1945.) **Hematic and anatomic changes in dogs after repeated intravenous injections of large amounts of inulin solution.**—*Arch. Path.* **40.** 11–13. [Author's summary copied *verbatim*.] **1132**

The intravenous injection of large amounts of inulin dissolved in 0·65 per cent saline solution elicits hydremic phenomena during the first twenty-four hours after injection. The hydremic conditions may become persistent when daily injections are given over a period of two months. In only 1 of 4 dogs did the renal tubules show inulin casts which elicited a foreign body reaction. There was no evidence of colloidoclastic responses in the blood of the treated animals or of storage phenomena in the vascular walls and internal organs of any of the dogs. The daily repeated intravenous injection of a sterile and pyrogen-free solution of inulin, administered over a period of two months, did not elicit any serious untoward reactions in the blood or the internal organs.

PEREIRA, R. S., & ARAUJO, J. O. (1941.) O ferro em biologia. Processos colorimétricos para a dosagem desse elemento. Aplicação do método de Salomé Pereira á determinação do ferro sérico. **[Role of iron in the body. Colorimetric tests for iron estimations and the determination of serum iron.]**—*Rev. Fac. Med. vet. S. Paulo.* **2.** No. 1. 67–103. [English summary.] **1133**

The authors give a short but detailed review of the present knowledge of the function of iron in the animal body and comment briefly on 17 different colorimetric methods for its estimation. They then discuss the presence of iron in serum and its significance there and describe a method involving ionization of the iron and precipitation of the proteins, followed by colorimetric estimation in the Zeiss-Pulfrich photometer of the iron complex of protocatechuic acid.—I. W. BROCKLEHURST.

BELL, F. R., & JONES, E. R. (1945.) **Glucose tolerance in the bovine.**—*J. comp. Path.* **55.** 117–124. **1134**

The oral administration to adult Ankole-Zebu cattle of glucose or sucrose in doses up to 8 g. per kg. body weight, had no effect on the blood sugar level. The subcutaneous injection of glucose gave a significant hyperglycaemia after one hour and the level fell only slightly after two hours. Intravenous administration of glucose caused a marked rise in the blood sugar level (up to 275·8 mg. per 100 ml.), the value falling to normal within two hours, irrespective of the dose given. Removal of blood glucose was 1·0–2·5% per min. and seemed independent of the degree of hyperglycaemia present. The maximum concentration of glucose in the urine was 5·7% and the maximum duration of glycosuria was 94 min. The renal threshold was 98 mg. per 100 ml. for an ascending blood sugar and 102 mg. per 100 ml. for falling blood sugar. Quantities of glucose up to 0·5 g. per kg. body weight had no untoward effect when given intravenously.—E. G. WHITE.

BLANDAU, R. J. (1945.) **On the factors involved in sperm transport through the cervix uteri of the albino rat.**—*Amer. J. Anat.* **77.** 253–272. **1135**

It has been noted by several workers that if rats are artificially inseminated by placing sperm suspensions into the vagina during oestrus, sperms do not invariably enter the uterine cornua. With g. pigs and rabbits similarly treated, sperm may, however, be found in the cornua after a short interval. This failure in the rat of sperm artificially deposited in the vagina to penetrate through the cervix appears to be associated with the high state of tonus of the cervix of this species during oestrus. In the experiments described, it is shown that sperm ejaculated into the vagina of oestrous females by males whose vesicular and coagulating glands have been ligated, do not pass through the contracted cervix. The formation of the copulation plug in the rat thus seems to play a vital role in the normal transport of sperm through the cervix. By means of an ingenious artificial penis, it was demonstrated that the particular anatomy of the glans and prepuce of the male rat play an important part in exposing the orifices of the cervical canals during normal ejaculation. The authors suggest that the female orgasm plays a role in effecting momentary cervical relaxation at the time of ejaculation and copulation plug formation, making possible the ingress *en masse* of sperm into the cornua. The probable sequence of events during normal insemination is discussed.—N. J. SCORGIE.

ROWLANDS, I. W. (1944.) **Capacity of hyaluronidase to increase the fertilizing power of sperm. [Correspondence.]**—*Nature, Lond.* **154.** 332–333. **1136**

Experiments on rabbits showed that although the action of hyaluronidase was very variable under the conditions tested, it increased the fertilizing capacity of dilute sperm suspensions, on an average, to the extent that to give a 50% response treated groups required about one-sixth of the sperm concentration required by control groups.

R. suggests that these experiments may throw some light on the number of spermatozoa required in order that one or more may reach the Fallopian tube.—R. A.

LEONARD, S. L., & KURZROK, R. (1945.) **A study of hyaluronidase-effects on the follicle cells of ovulated rat ova.**—*Endocrinology.* **37.** 171–176. **1137**

The authors confirm the recent discovery of McCLEAN *et al.* [*V. B.* **13.** 300, and see also FEKETE *et al.*, *V. B.* **13.** 437] that hyaluronidase is capable of dispersing the follicle cells of mammalian ova and show that antisera formed against bull testis extracts containing hyaluronidase can inhibit or prevent its action in dispersing the follicle cells of rat ova *in vitro*. On the other hand, ova from the immunized rats were affected by hyaluronidase at the same rate as ova from normal rats. These findings agree with those of McCLEAN [*V. B.* **14.** 57] who used a different method of test.

Hyaluronidase was used in the artificial insemination of five human subjects, employing previously tested potent donors. The semen samples during previous months had failed to produce pregnancies but did so promptly upon the addition of 20 mg. of hyaluronidase prepared from bull testis [see preceding abst.].

It was found that normal undiluted rat serum inhibited the action of hyaluronidase on the follicle cells *in vitro*, and it is suggested that this finding has its counterpart in human sterility as when bleeding from any cause (*e.g.*, lesions of cervix or uterus, dilation of cervix at artificial insemination) occurs during copulation or insemination.

In one experiment the uterine fluid of an immunized rat inhibited the action of hyaluronidase, and it is suggested that some types of sterility, previously attributed to sperm immunity, may in fact be due to antibodies to hyaluronidase. Investigations are now being conducted to determine whether the blood serum of sterile women, in whom no demonstrable cause for sterility is apparent, has an inhibitory effect upon the hyaluronidase reaction on rat ova.—N. J. SCORGIE.

KUMARAN, J. D. S. (1944.) **The percentage of conception in artificial and natural breeding.**—*Indian vet. J.* **21.** 137–140. **1138**

K. concludes that in artificial insemination of ewes and cows, the number of inseminations required for each conception is lower than in natural matings.—S. G.

WRIGHT, L. E. A., ROBINSON, A. R., & TRIKOJUS, V. M. (1944.) **The influence of the thyrotrophic hormone on the blood cholestrol of intact and thyroidectomized rabbits fed cholesterol.**—*Aust. J. exp. Biol. med. Sci.* **22.** 209–214. **1139**

When thyrotropic hormone injections are given for a short period to hypercholesterolaemic rabbits, there is a sharp fall in the blood cholesterol in both the intact and the thyroidectomized animal. In the intact animal this initial fall is followed by a marked and prolonged rise in the blood cholesterol level. Certain rabbits fed cholesterol showed "resistance" to the development of hypercholesterolaemia. Thyroidectomy or injections of thyrotropic hormone abolished this "resistance".—J. D. STEEL.

PAIVA, O. M. (1941.) Anotações craniológicas I. **[Notes on craniology. I.]**—*Rev. Fac. Med. vet. S. Paulo.* **2.** 9–26. [English summary.] **1140**

The first part of this article deals with the sutural (bregmatic) bones, occurring in the mid-line at the fronto-parietal junction of Leporidae. Of 51 skulls of the European rabbit, *Oryctolagus cuniculus*, examined, eight showed the presence of bregmatic bones, five being double and three single. The skulls were examined for the so-called bigeminate articulation of the bregma; 19 specimens showed frontal with left parietal articulation, and 19 were of the frontal with right parietal type.

Only one out of 24 skulls of sheep possessed a bregmatic bone, and in this it was single, there were supplementary horn appendages and there was no union between the parietal bones, the animal being 9–12 months old. Two other sheep skulls, from animals 5–6 months old and 8–9 months old respectively, showed absence of union of the parietal suture for distances of 6·0 and 7·8 mm. respectively. In the first case the opening was at the posterior end, in the second at the anterior end of the sagittal suture.

There is a photograph of a donkey's skull; several islands of bone can be seen clustering round a bregmatic bone but only on the external surface.—I. W. B.

See also absts. **1106** (endocrine aspects of canine neoplasms), **1113** (haematology of sheep), **1219** (dissection guide for veterinary anatomy).

POISONS AND POISONING

GOPALAKRISHNAN, V. R. (1943.) **Cattle poisoning in Assam.**—*Indian Fmg.* **5.** 77–79. **1141**

Malicious poisoning of cattle in Assam is common among traders in hides and bones, especially during outbreaks of anthrax, blackleg, haemorrhagic septicaemia or rinderpest, or when the prices of hides and bones are high. "Chamars" (professional flayers) are employed, the common methods of poisoning being crude arsenic mixed in the fodder, spread over the pasture or given as a bolus; a thick paste, prepared from ground *Abrus precatorius* seeds, gram-flour and water, is smeared on a spike or needle used to pierce the region of the neck, throat, or hind quarters; or rarely, oleander or wild tobacco. Differential symptoms in cases of poisoning and of the diseases mentioned are given.—G. L. SHARMA.

FINCHAM, I. H. (1945.) **Copper poisoning in sheep.**—*Vet. Rec.* **57.** 581. **1142**

F. reports an outbreak of Cu poisoning amongst Romney Marsh yearling sheep grazing pasture under fruit trees recently sprayed with Bordeaux mixture. Symptoms lasted 24 hours or less and were characterized by incoordination of movement, weakness and yellowish coloration of the conjunctival mucous membranes. Twelve animals died out of 101. 77 newly bought-in sheep which were grazed with them and were in better condition, were unaffected. P.M. examination revealed generalized icterus of the tissues and the liver enlarged, yellow in colour and very friable. There was excessive pericardial fluid with epicardial haemorrhage, the kidneys were enlarged and there was haemorrhagic nephritis with dark haemorrhagic mottling on the external surfaces. The spleen when cut open resembled blackberry jam. Analysis of the liver showed Cu storage amounting to 48–62 mg. %.

The Cu poisoning is explained in that the weather was dry and practically no growth of grass had occurred between spraying and the time the sheep had access to the orchard, the animals thus being forced to consume old grass heavily contaminated with Bordeaux mixture.
—A. EDEN.

SEDDON, H. R. (1945.) **Chronic endemic dental fluorosis in sheep.**—*Aust. vet. J.* **21.** 2–8. **1143**

S. describes cases of chronic endemic dental

fluorosis occurring naturally in sheep in Central Queensland drinking from artesian wells, the waters of which contained up to 19 p.p.m. fluorine. Mottling of the enamel, chalkiness and marked irregularity of wear are characteristic in both incisor and molar teeth. The wear is sometimes so rapid that by four years of age the incisors appear to be those of an animal twice the age and the molars are so worn that normal mastication is impeded. The economic considerations arising from these abnormalities are of the greatest importance, particularly as there is evidence that the disease is fairly widespread in the area of the Great Artesian Basin in Queensland.—R. L. REID.

JOHANNSEN, A. (1943.) Förgiftning hos häst i anslutning till lavemang med ättiksyralösning. **[Poisoning of horses caused by lavage with a solution of acetic acid.]**—*Skand. VetTidskr.* **33.** 659–677. [English and German summaries.] **1144**

Six draught horses were dosed by the owner with acetic acid (15 litres of 2·5% solution) by stomach tube for *Oxyuris* infestation. All developed enteritis and four were taken to hospital for detailed examination and treatment. Two died and the other four recovered. Symptoms were dullness and slight fever; the visible mucosae were red and icteric, the pulse and respiration were rapid and there was anorexia. There was oedematous inflammation of the wall of the rectum which contained unformed faeces. P.M. findings were subserous haemorrhages in the small intestine and its mesentery, hyperaemia of the mesenteric lymph nodes, diphtheritic inflammation of the small colon with subserous haemorrhages, and oedema of the rectum.

The surviving horses were treated with linseed mucilage and recovered within about ten days.

In order to find the maximum safe concentration of acetic acid which can be given, J. administered acetic acid perorally or rectally to seven rabbits, five of which, given a concentration of 0·5% or higher, died from necrotic enteritis in 2–5 days, the results being the same with both routes. Coprostasis occurred in three of those which died, and peritonitis in three, with myocarditis and waxy degeneration of skeletal muscles. These changes did not vary directly with the dose given, the most severe intestinal lesions occurring in rabbits which survived for the longest time. Acute poisoning by strong acid left relatively slight morbid change.

Acetic acid therapy for *Oxyuris* infestation is condemned.—J. E.

SCHANG, P. J., & ARAMENDI, M. C. (1944.) Intoxicación de novillos por Cynodon Dactylon (L.) Pers. **[Poisoning of young bulls caused by *Cynodon dactylon* (Bermuda grass).]**—*Gac. vet., B. Aires.* **6.** 264–276. **1145**

Outbreaks of disease in young bulls were traced to the ingestion of Bermuda grass, which these animals take voluntarily. The symptoms of the artificially induced intoxication are identical with those of the natural disease. They comprise shaking of the head, contraction of the facial muscles and grinding of the teeth, followed by general trembling and marked hypersensitivity. When the affected animals are made to move, they walk with a stiff gait with the forelegs rigid (the "goose-step"). There is incoordination of movement and the animals tend to fall and to remain recumbent, although they are still hypersensitive, and to show tetanic contractions. There is congestion of the mucosae, but the temperature remains normal, except after the muscular contractions. If further access to the grass is prevented, symptoms continue 10–15 days and then the animals recover. Animals suffering from a chronic intoxication become very emaciated. In spite of the alarming symptoms, the death rate is low; in observations made only three deaths occurred in 40 affected animals. A P.M. examination was carried out on two of these three animals. The blood coagulated slowly, the gastric mucosa was congested, with reddish-black spots on the surface and in the folds. The large intestinal and caecal mucosae were suffused with blood, the bile was thick and stringy. The meninges were red and congested. The other organs were apparently normal.

It was suspected, but not proved, that young foals were also susceptible to poisoning by this plant. Attempts to reproduce the condition in one sheep, four swine and four g. pigs were unsuccessful.

Bermuda grass is apparently toxic from June to October, even when it is dry. [*C. dactylon* is widely used as a pasture grass in tropical countries. STEYR tested specimens grown at Onderstepoort and found HCN present in small quantity in fresh specimens and in very large amounts in wilted specimens during hot dry weather.]—I. W. BROCKLEHURST.

FRANKLIN, M. C., & REID, R. L. (1944.) **Observations on the cyanogenetic properties of linseed "nuts". Part I. Feeding trials with sheep.**—*Aust. vet. J.* **20.** 332–337. **1146**

The "available" HCN content of several samples of linseed nuts and a sample of linseed oil meal used for stock feeding in Australia was 48–62 mg. per 100 g. When sheep were fasted for five days and then force-fed a gruel, prepared from crushed linseed nuts, the consumption of sufficient gruel to provide 1·81 mg. or more of available HCN per lb. body weight proved fatal in every case. This represented an intake of 300–400 g. of linseed meal by sheep of 80–100 lb. live weight. In other fasting experiments, consumption of linseed nuts was never sufficiently rapid to lead to actual losses, although in several instances temporary symptoms of HCN poisoning were shown. The sheep used in these experiments had not been fed linseed nuts previously and field evidence suggests that consumption of linseed nuts by sheep used to this feedstuff can reach dangerous levels after fasting. Where linseed nut consumption after fasting was not too rapid much larger quantities could be tolerated. For example, over a 24-hour period, fasted sheep consumed sufficient to yield up to 5 mg. HCN per lb. body weight without harmful effect.

There were no fatalities among unfasted sheep receiving linseed nuts in amounts comparable to fasted animals and in practice it would appear that there is little, if any, likelihood of unfasted sheep consuming sufficient linseed nuts to lead to harmful effects even when the "available" HCN content of the nuts is 50–60 mg. per 100 g. of material. However, it is suggested that care be exercised in feeding linseed nuts to hungry stock "particularly if they have received no food for several days".—C. R. AUSTIN.

HERBUT, P. A., & SCARICACIOTTOLI, T. M. (1945.) **Diffuse hepatic necrosis caused by sulfadiazine.**—*Arch. Path.* **40.** 94–98. **1147**

Two case histories are given of patients with diffuse hepatic necrosis following administration of sulphadiazine; four similar cases have been reported in the literature. The lesion is thought to be due to inherent or acquired hypersensitivity to the drug rather than to direct chemical action on the liver cells. It is recommended that sulphadiazine be used with caution, as it may have toxic effects on both the liver and kidneys. —E. BOYLAND.

BLACK-SCHAFFER, B. (1945.) **Pathology of anaphylaxis due to sulfonamide drugs.**—*Arch. Path.* **39.** 301–314. **1148**

The main lesions found in five human patients who died after sulphonamide therapy were a necrotizing fibrinoid arteritis of the smaller vessels, cellular exudates with monocytes predominating, and hyperplasia of the reticulo-endothelial system represented by crowding of the sinusoids of the spleen, lymph nodes and bone marrow, with macrophages showing phagocytosis of the erythrocytes and leucocytes. This picture is similar to that reported in cases of protein anaphylaxis in man and animals. It is suggested that a hypothetical reaction between sulpha drugs and the blood cells of some individuals may result in the production of a conjugated protein which is antigenic, eliciting the production of antibodies and accounting for the lesions described and the symptoms of haemolytic anaemia, leucopenia and agranulocytosis.—M. L. Levi.

Calvery, H. O. (1945.) **DDT is poisonous. Tolerance level deemed necessary when it is used on human food.**—*Texas vet. Bull.* **7.** No. 8. 2 & 6. **1149**

The use of D.D.T. may be attended by poisoning under certain conditions. Symptoms include diminished appetite, loss of weight, nervousness, tremors and finally convulsions. The liver and thyroid glands may be affected and slight dermatitis may develop.

A solution of D.D.T. in inert solvents may be absorbed by both the abraded and intact skin. The injection of 150 mg. D.D.T. per kg. body weight daily caused death in rabbits, rats and g. pigs after 30 days. D.D.T. fed to rats at the level of 0·1% of the food intake caused death in 18–80 days and at 0·05% the animals survived three months, but there was some impairment of growth, accompanied by a mild degree of anaemia though without effect on the white blood cell counts. Judging from animal tests the safety level for man cannot be above 10 p.p.m. Poisoning from D.D.T. appears to be cumulative. The best antidote appears to be the administration of sedatives.

Cases reported as D.D.T. poisoning may have been due in part to the solvents employed for it, but as a safety precaution spray operators should wear respirators and prevent contact with the skin.—A. Eden.

Blount, W. P. (1945.) **Chemical defence experimental station (veterinary section).**—*Vet. Rec.* **57.** 543. **1150**

The chief concern of this section was the development of respirators and protective clothing for army animals. The symptoms and treatment of animals suffering from the effects of experimental exposure to poison gases were also studied.

An efficient respirator for dogs was designed and pigeons were protected by the use of a "ventilated" basket cover. Equines were provided with eye shields, respirator, an over-all cover and leggings. Research was still in progress.

Other work included co-operation with the Navy under the direction of Surgeon Rear-Admiral Wakeley in research on the effects of under-water blast resulting from the explosion of depth charges and on means of protecting submerged personnel from these, and co-operation with the Army Pigeon Service in an investigation of pigeon diseases. An investigation on the control of lungworms in goats by the inhalation of gases was carried out for two years by Miss M. I. Speyer, a zoologist attached to the section for the purpose. Clinical trials were made of insecticides, drugs for treating coccidiosis and intravenous nembutal anaesthesia of monkeys, and work proceeded on the breeding of insects for experimental work. Toxicity experiments on cattle were carried out with certain components of the German V1 bomb, and with TNT-containing nitrogenous residues capable of use as land fertilizers; the value of new compounds allied to α-naphthylthiourea as rat poisons and the effects of white phosphorus ingestion on farm animals were also estimated.—J. A. Griffiths.

See also absts. **1112** (linseed nut poisoning), **1113** (yellowses), **1161**, **1192** (sulphonamide toxicity), **1181** (D.D.T. toxicity), **1193** (chloroform antidotes).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

Green, D. F. (1945.) **Some newer chemotherapeutic agents.**—*N. Amer. Vet.* **26.** 407–414. **1151**

In this review G. describes the successful use of penicillin in the treatment of various types of mastitis and its possibilities in the veterinary treatment of wounds. Streptomycin may have useful applications against Gram-negative organisms. D.D.T. as an insecticide obviously has many veterinary applications, *e.g.*, against lice, fleas, and houseflies.—E. Boyland.

Anon. (1944.) **A review of the present information concerning penicillin.** pp. 112. North Chicago, Ill: Abbott Research Laboratories. **1152**

The ground covered includes the historical background to the discovery of penicillin, the bacteriological investigation of its properties, a comparison of its therapeutic action with that of other chemotherapeutic drugs, the sulphonamides, gramicidin, etc. and the effect of penicillin on resistant organisms. There is a well illustrated account of its production, purification and properties, a section on pharmacology, unitage, its clinical uses as reported in the literature, and various methods of administration, and a bibliography with 179 references.—E. Boyland.

Riser, W. H. (1945.) **Penicillin in veterinary medicine.**—*N. Amer. Vet.* **26.** 415–418 & 424. **1153**

In this review, R. gives a useful table of animal diseases known to respond to penicillin treatment. The recommendation is made that treatment should be continued for 24–48 hours after the temperature has returned to normal, so that signs of active infection will not reappear.—E. Boyland.

Jern, H. Z., & Meleney, F. L. (1945.) **The superiority of penicillin over bacteriophage, sulfathiazole and certain other antibacterial substances as indicated by experimental staphylococcal infections in chick embryos.**—*Surg. Gynec. Obstet.* **80.** 27–34. [Abst. in *Bull. Hyg., Lond.* **20.** 351, copied *verbatim.* Signed: L. P. Garrod.] **1154**

These authors have in the past advocated the use of bacteriophage for the treatment of staphylococcal infections. In this study they have compared the action of bacteriophage with that of penicillin and some other antiseptics by an experimental method.

The chorio-allantoic fluid of 10-day chick embryos was inoculated with staphylococcus culture: this caused death in untreated eggs within 24 hours. Immediate introduction of bacteriophage prolonged life, but did not completely destroy the staphylococci, nor prevent them from entering the blood-stream. Penicillin, on the other hand, not only prevented the development of infection, but also completely sterilized 76 per cent. of eggs treated with 100 units: this dose could be injected at any time up to six hours after inoculation. A dose of 10 units had a similar effect: 1 unit was inadequate. Other agents tried and found completely or relatively ineffective were ceepryn (cetyl pyridinium

chloride) and phemerol (given in addition to bacteriophage without improving its effect), sulphathiazole, two antisera, carboxy-methoxylamine (sterilized, but was too toxic), Vioform, and an extract of a Gram-positive sporulating bacillus.

LIONS, F. (1943.) **Penicillin, gramicidin and related substances.**—*Aust. J. Sci.* **6.** 17–20. **1155**

This review article contains no new material, but deals with the history, chemical composition, mode of action, preparation and uses of penicillin and other antibiotics.—D. C. BLOOD.

ATKINSON, N. (1942.) **Antibacterial substances produced by moulds. 1. Penicidin, a product of the growth of a penicillium. 2. The antibacterial substances produced by some common penicillia. 3. The detection and estimation of antibacterial activity** *in vitro*.—*Aust. J. exp. Biol. med Sci.* **20.** 287–288 and **21.** 15–16 & 127–131. **1156**

ATKINSON, N., & STANLEY, N. F. (1943.) **Antibacterial substances produced by moulds. 4. The detection and occurrence of suppressors of penicidin activity. 5. The mechanism of the action of some penicidin suppressors.**—*Ibid.* **21.** 249–253 & 255–257. **1157**

1. A penicillium (mould 9) produced a substance inhibitory to both Gram-positive and Gram-negative organisms. It was grown on Abraham's modification of Czapek-Dox medium for 3–5 days and the liquid was Seitz-filtered and stored at 3°C. The active ingredient was extracted with ether at pH 7, after concentration of the mother liquid *in vacuo* to 10% of the original volume. Thorough drying of the ether extract, evaporation *in vacuo* to small volume and the addition of petroleum ether caused separation of the "penicidin" as a yellow oily fluid which inhibited *Salmonella typhi* at 1 : 100,000. Penicidin was found to be relatively heat-resistent in neutral solution and not readily destroyed by HCl or H_2SO_4, but fairly easily destroyed by KOH or $Ba(OH)_2$. It was soluble in chloroform, ether, ethyl alcohol and dilute mineral acids, but not in petroleum ether. Certain other characteristics are briefly recorded.

2. Of 68 penicillia derived from various sources and tested by A., 18 showed activity against various bacteria; these could be divided into those affecting mainly Gram-positive bacteria (penicillin or citrinin) and those affecting both Gram-positive and Gram-negative bacteria (penicillic acid or penicidin). Members of the first group were commonly found as contaminants of laboratory media and the second group was derived mainly from among penicillia on fruit and vegetables. Chemical tests and methods for the detection of antibacterial activity are described.

3. Methods for qualitative and quantitative estimation of antibacterial activity were devised for use with active mould metabolism solutions. Their merits are discussed. Dilution in agar is recommended because activity against a range of bacteria can be tested under identical conditions.

4. A test for "penicidin-suppressors" is described in which a standard medium containing casein-hydrolysate was used with *Salmonella typhi* as the test organism.

Slow suppressors were demonstrated in culture media, serum and various substances of animal and vegetable origin. These suppressors are effective after a period of preliminary incubation and may result from a chemical reaction or a slow adsorption between the penicidin and the suppressor substance. The activity of penicidin is also suppressed by sodium thioglycollate but in this case inactivation occurs without any preliminary incubation. The mode of action of sodium thioglycollate is discussed and it is suggested *inter alia* that its effect may depend upon the SH group.

5. Proceeding from the observation that sodium thioglycollate suppressed penicidin action, the possibility that this was dependent upon the SH group was investigated. Several SH compounds and other reducing agents were tested. It was found that penicidin is suppressed specifically by SH compounds and the authors suggest that this is due to a chemical reaction between the penicidin and the SH group.

—D. A. GILL.

BUSH, M. T., GOTH, A., & DICKISON, H. L. (1945.) **Flavicin. II : an antibacterial substance produced by an** *Aspergillus flavus*.—*J. Pharmacol.* **84.** 262–277. [For previous article, see *V. B.* **13.** 439.] **1158**

Flavicin has been purified by fractional extraction and chromatography, so that preparations with 12,000 staphylococcus dilution units (800 Oxford units) per mg. have been obtained. Flavicin is similar to and may be identical with penicillin.—E. BOYLAND.

BURKHOLDER, P. R., EVANS, A. W., MCVEIGH, I., & THORNTON, H. K. (1944.) **Antibiotic activity of lichens.**—*Proc. nat. Acad. Sci., Wash.* **30.** 250–255. [Abst. in *Rev. appl. Mycol.* **24.** 111, copied *verbatim*.] **1159**

When the antibacterial activity of the extracts from 42 species of lichens was determined by means of the cup plate procedure, it was found that 27 species were active against *Bacillus subtilis* or *Staphylococcus aureus*, four against *Proteus vulgaris* or *Alcaligenes faecalis*, but none against *Escherichia* [*Bacterium*] *coli*.

OFFICER, R., LOEWENTHAL, J., & PERRY, J. W. (1944.) **Penicillin : an investigation and clinical trial.**—*Med. J. Aust.* Nov. 4th. 473–487. **1160**

This is a review of the literature on penicillin illustrated by examples from 141 cases treated with penicillin by the authors. The cases included osteomyelitis, lobar pneumonia, renal tract infections, meningitis, local staphylococcal infections, burns, scalds and compound fractures. Local and systemic methods of administration were used, employing the sodium and the "crude" and "refined" calcium salts; the "refined" calcium salt was found to be as effective as the sodium salt. No increase in penicillin resistance of organisms was noticed in cases treated by parenteral methods. The sodium and "refined" calcium salts were administered by intrathecal injection without the production of toxic symptoms. Consideration is given to the complications of penicillin therapy with special reference to the phlebitis occurring so commonly after intravenous injection of the drug. A new routine for intramuscular injection, in which five doses were given at hourly intervals, night and morning, proved less disturbing. The outstanding feature of the trial was the early symptomatic response with increased appetite and better sleep. This subjective improvement may precede diminution of signs.—D. C. BLOOD.

I. WIEN, R., HARRISON, J., FREEMAN, W. A., & PHILLIPS, G. E. (1945.) **Therapeutic activity and toxicity of soluthiazole and solupyridine.**—*J. Pharmacol.* **84.** 203–210. **1161**

II. WIEN, R., & HAMPTON, J. W. F. (1945.) **The absorption and excretion of soluthiazole and solupyridine.**—*Ibid.* 211–218. **1162**

I. These compounds are disodium cinnamylidene bisulphite derivatives. They are very soluble in neutral solution and the solutions can be sterilized by autoclaving in closed containers. They are very effective in streptococcal and pneumococcal (but not staphylococcal) infections, are non-toxic and non-irritating and produce little or no urolithiasis.

II. These substances after injection quickly give high blood concentrations. They are rapidly excreted so that 40–75% of the dose is excreted from human patients in 12 hours. The concentration in cerebrospinal fluid is much lower than in blood. Neither compound appears to be acetylated or conjugated to any considerable extent.—E. BOYLAND.

LAWRENCE, C. A. (1945.) **In vitro studies on the antibacterial actions of para-aminomethylbenzenesulfonamide derivatives.**—*J. Bact.* **49.** 149–158. **1163**

Different salts (*e.g.*, hydrochloride, sulphosalicylate and mandelate) of *p*-aminomethylbenzene sulphonamide are equally effective in inhibiting the growth of β-haemolytic streptococci, *Streptococcus viridans*, pneumococci (types I, II and III), *Staphylococcus aureus* and *Pseudomonas aeruginosa*. These substances also have some slight antibacterial action against *Streptococcus faecalis*. The inhibitory action is not neutralized by either *p*-aminobenzoic acid or by *p*-aminomethylbenzoic acid. Salts of *p*-(β-aminoethyl)-benzene sulphonamide have no inhibitory action on anaerobic organisms.—E. B.

WURM, K. (1943.) Ueber die Wirkung einiger Sulfonamide auf gramnegative Bakterien in vitro. **[The action of various sulphonamides upon Gram-negative bacteria.]**—*Z. ImmunForsch.* **104.** 263–274. [Abst. in *Bull. Hyg., Lond.* **19.** 893–894, copied *verbatim.* Signed: F. HAWKING.] **1164**

The action of the compounds upon the growth of bacteria was tested by a method described by WURM and HSIÄ in Zt. f. Immun. 1942. v. 101, 81. The main feature of the method appears to be the passage of the strain at 12-hour intervals through six tubes of nutrient medium containing the drug in a concentration of 20 mgm. per 100 cc. Bacteria of the Friedländer group were highly sensitive to the antibacterial action of the drug except for *Calymmatobacterium granulomatis* (the questionable cause of granuloma venereum). Typhoid bacilli were affected by some compounds but paratyphoid strains were completely resistant. *Ps. pyocyanea* was more resistant than *Proteus*. It was interesting that in some of the cultures of *Ps. pyocyanea* in the presence of sulphonamide the production of pigment was suppressed. As regards the preparations tested, sulphathiazole and sulphapyridine were the most active and next to them globucid and sulphadiazine. Sulphacetamide also had a good action. Sulphaguanidine and a soluble compound called L 31 exerted only slight action, and prontosil soluble was inactive.

RICHOU, R., & HOLSTEIN, G. (1944.) L'anatoxithérapie staphylococcique en médecine vétérinaire.—Résultats d'ensemble. **[Staphylococcal anatoxitherapy in veterinary medicine.]**—*Bull. Acad. vet. Fr.* **17.** 356–368. **1165**

This article is a review of the uses of the staphylococcal anatoxin described in numerous articles by RAMON *et al.* Good results are reported in prophylactic vaccination before, for example, castration of colts and in treatment of specific staphylococcal infections such as staphylococcal mastitis. It is suggested that the anatoxin could be combined with other therapeutic measures, *e.g.*, penicillin, with advantage.—J. B. B.

JUNG, B. (1944.) Versuche mit Eubasin bei Pferden unter besonderer Berücksichtigung des Blutbildes und die praktische Anwendung bei Erkankungen des Atmungsapparates. **[The effect of sulphapyridine on the blood picture of the horse and its use in diseases of the respiratory system.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 1st. 282–283. **1166**

Since sulphapyridine has been employed in human medicine for the treatment of pneumonia, cerebrospinal meningitis and gonorrhoea with considerable success, J. decided to investigate its use in horses. Experiments were carried out on ten healthy horses. The drug was used in solid form and in 30% solution and it was found that 15 g. could be given intravenously on the first day and then 20 g. orally on the subsequent days, the total dose being 150–200 g., without ill-effect. In most cases the blood count showed a decrease in the number of lymphocytes and an increase in the number of polymorphonuclear leucocytes, with a more or less marked "shift to the left". Pathological examination of two of the treated horses after slaughter revealed no significant lesions.

J. employed the drug with good results in two cases of strangles, a case of severe pharyngitis and in two cases of broncho-pneumonia. In two other cases of broncho-pneumonia there was a relapse after an initial response to sulphapyridine, but further treatment resulted in complete recovery. In most of these cases examination of the blood revealed a slight increase in the number of the white corpuscles and the differential count showed there to be a decrease in the number of lymphocytes and an increase in the number of polymorphonuclear leucocytes. The drug was also employed with good effect in one case for local application after dressing to a suppurating head wound.

J. stresses the fact that the treatment gives best results when initiated in the early stages of the disease. He recommends the use of a daily dose of 15 g. given intravenously or 20 g. given orally up to a total dose of 150–200 or even 250 g.—T. E. GIBSON.

SCHNELLE, G. B. (1945.) **Treatment of osteomyelitis with penicillin.**—*N. Amer. Vet.* **26.** 540–542. **1167**

S. records two cases diagnosed by the use of X-rays, one localized in the atlas and the third cervical vertebra, the other in the elbow. Drainage and multiple doses of penicillin every three hours for 20–23 days (daily average 36,000 units in a 50 lb. greyhound and 24,000 in a 46 lb. bull terrier) were administered with good results.—M. L. LEVI.

PICHAT, P. (1945.) Action *in vivo* sur la bacille de Koch des épanchements pleuraux tuberculeux du p-amino-benzène sulfonyl-thiourée, injecté dans la cavité pleurale. **[The *in vivo* action of *p*-aminobenzenesulphonyl thiourea injected in the pleural cavity on Koch's bacillus in pleural tuberculous effusions.]**—*C. R. Soc. Biol. Paris.* **139.** 124. **1168**

In cases of old-standing tuberculous effusions, the thickening of the pleura produces a closed cavity in which *p*-aminobenzenesulphonyl thiourea injected into the pleural cavity can reach a concentration sufficient to destroy the bacilli. In two cases, daily injections of the drug resulted in a temporary disappearance of the bacilli, but they reappeared soon after treatment was stopped.—R. E. GLOVER.

HEILMAN, F. R., & HERRELL, W. E. (1944.) **Penicillin in the treatment of experimental infections due to Erysipelothrix rhusiopathiae.**—*Proc. Mayo Clin.* **19.** 340–345. **1169**

The history of swine erysipelas in the U.S.A. is reviewed briefly and the history, symptoms, diagnosis and treatment of erysipeloid are dealt with more fully. The main part of the paper describes tests made with penicillin *in vitro* and in experimentally infected white mice. Three strains of *E. rhusiopathiae*, one of which had been isolated from turkeys, were used. All three were sensitive *in vitro*, growth being inhibited in tubes containing 0·1 of an Oxford unit per ml. Eighty white mice were inoculated with virulent culture. Forty were treated with penicillin at varying periods after infection; 40 were untreated and served as controls.

The mortality in the untreated mice was 100%. Only two of the 40 mice treated with penicillin died.

The authors assume that penicillin should prove to be effective in treatment of this disease in man and in pigs.—M. C.

EDMONDS, E. V. (1945.) **Use of sulfathalidine (phthalylsulfathiazole) in the treatment of enteritis in swine.**—*J. Amer. vet. med. Ass.* **107.** 238–241. **1170**

314 pigs from 18 different herds were treated for an enteritis complex with good results. Single daily doses of sulphathalidine in tablet form were administered *per os* for 4–6 days. The dosage was 0·25–2·0 g. in unweaned pigs, 0·5–1·3 g. per 10 lb. body weight in porkers, and 0·2 g. per 10 lb. in bacon pigs.—M. L. L.

HARDY, A. V. (1945.) **Studies of the acute diarrheal diseases. XC. Further cultural observations on the relative efficacy of sulfonamides in *Shigella* infections.** —*Publ. Hlth Rep., Wash.* **60.** 1037–1042. **1171**

H. recommends sulphadiazine as the best sulphonamide for shigella infections in human beings, with sulphasuxidine as an alternative, where response has been poor. Other alternatives are sulphapyrazine, sulphamerazine and sulphamethazine. Of the seven drugs which were widely tested, sulphathiazole and sulphaguanidine were the least potent.—I. W. B.

SCHWEINBURG, F. B., & YETWIN, I. J. (1944.) **In vitro action of sulfamerazine, phthalylsulfadiazine, phthalylsulfamerazine and phthalylsulfathiazole on enteric pathogens.**—*New Engl. J. Med.* **230.** 510–514. [Abst. in *Bull. Hyg., Lond.* **19.** 893, slightly amended. Signed: J. C. CRUICKSHANK.] **1172**

Sulphamerazine is 2-sulphanilamido-4-methylpyrimidine. The other three substances consist of known compounds to which a phthalyl radical has been added. The bacteriostatic and bactericidal action of these drugs against a range of bacteria was tested by setting up a series of dilutions in broth at pH 7·6. The organisms consisted of a single strain of each of the following: *Bact. coli, Salmonella typhi, S. paratyphi*-A and -B, *S. enteritidis, S. cholerae-suis, Bact. shigae, Bact. flexneri* and *Bact. sonnei.*

The results, which are compared with others previously obtained, do not lend themselves to brief summary, but certain conclusions may be noted. Sulphamerazine was more effective than sulphadiazine against *Bact. shigae, Bact. sonnei, S. enteritidis* and *S. cholerae-suis,* equally effective against *Bact. flexneri* and less effective against the other bacteria. The addition of the phthalyl radical to sulphadiazine made it more effective for most of the dysentery organisms and *S. enteritidis.* Phthalylsulphathiazole also had some limited advantage over sulphathiazole against *S. typhi, Bact. flexneri* and *S. enteritidis.* Sulphamerazine, however, was better than phthalylsulphamerazine against all the organisms studied.

It is observed that the phthalyl radical is easily split from the various compounds so that results obtained *in vivo* may not in fact differ from those produced by the simpler sulphonamides.

WALKER, J. M., & HAMILTON, J. W. (1945.) **The treatment of actinomycosis with penicillin.**—*Ann. Surg.* **121.** 373–384. [Abst. in *Bull. Hyg., Lond.* **20.** 471, copied *verbatim.* Signed: J. T. DUNCAN.] **1173**

The authors describe the successful treatment with penicillin of six cases of actinomycosis, caused, presumably, by the anaerobic type of *Actinomyces* (the fungus was not cultivated). The cases were divided, clinically, into three groups: (*a*) with only the soft tissues involved (two cases); (*b*) with both bone and soft tissues involved (three cases); and (*c*) with generalized systemic disease (one case).

Preliminary treatment, in some cases very brief, with sulphadiazine, sulphathiazole, potassium iodide or X-ray therapy gave little, if any, favourable result. Penicillin was given in three-hourly doses of 15,000 Oxford units intravenously, but, later, this mode of administration was abandoned and *intramuscular* injections of 25,000 units at three-hourly intervals were given instead. All the cases responded favourably, but early apparent cure was, in some, followed by recurrence of the disease, necessitating a further course of penicillin. Prolonged treatment is therefore necessary and the total amounts of penicillin given were 4,300,000 units in the simplest case and 8,170,000 units in the severe generalized case. Whenever practicable, surgical treatment is a valuable adjunct to penicillin therapy.

In the single case of generalized systemic infection (Group *c*), both lungs, the caecum and ascending colon and the right side of the diaphragm were involved; there was a subhepatic abscess and the tissues about the right knee joint were infected. The patient was in a critical state when penicillin treatment was commenced. He was given 15,000 units intramuscularly, at three-hourly intervals, for about three weeks, the dose at each injection was then raised to 25,000 units for the next three weeks, and reduced again to 15,000 units for the final period of five weeks. Apparent cure resulted and seven months after the completion of the penicillin treatment there was no evidence of recurrence. In the authors' words "The response to penicillin was brilliant. It was almost unbelievable to see the rapid improvement of this dying man to penicillin therapy." "There is little doubt that penicillin is the most effective agent in treatment of actinomycosis."

WALLS, L. P., BROWNING, C. H., CALVER, K. M., & LECKIE, M. W. (1945.) **Researches in the phenanthridine series. Part VI. The relationship between structure and trypanocidal properties.**—*J. chem. Soc.* May. pp. 294–300. **1174**

Twenty-two monoamino and diamino derivatives of 9-phenyl-10-methylphenanthridinium chloride were synthesized and tested for therapeutic activity in infected mice. The 3 : 4′-diacetylamino-, the 7 amino-, the 3 : 7 diamino- and the 2 : 7 diamino- derivatives were effective against *Trypanosoma brucei.* Several diamino derivatives (the 7 : 4′-, the 7 : 3′-, the 3 : 3′-, the 3 : 7′-, the 2 : 7-, and the 7 : 4′-, Br = 3) were effective against *T. congolense* infections. Acetylation of the amines always resulted in diminution of activity.—E. BOYLAND.

MUKERJI, A., & DAS, D. N. (1945.) **"Preliminary report on canine coccidiosis and its treatment".**—*Indian vet. J.* **21.** 316–318. **1175**

Five cases of canine coccidiosis due to *Isospora bigemina* were encountered in Calcutta. Sulphanilamide was administered in one case with encouraging result. —H. N. RAY.

HILL, J. L. (1945.) **Further observations on the stability of lime-sulphur during dipping or spraying sheep.**—*J. Coun. sci. industr. Res. Aust.* **18.** 201–208. **1176**

A lime-sulphur dip containing 1% polysulphide sulphur recently came into use in Australia as a sheep dip for the control of *Psorergates ovis.* This paper deals with decrease in polysulphide sulphur content of the liquid when used in swim dips and power sprays respectively. In the first trial, the fluctuations of the polysulphide sulphur content in a 1,500 gal. swim dip were followed during a field dipping trial involving 6,500 sheep over a period of 10 days. The polysulphide sulphur content and polysulphide ratio decreased to a

slight extent with the passage of sheep through the dip and to a negligible extent while the dip was standing undisturbed overnight. In neither case was the decrease sufficient to render the dip ineffective. Three tests were carried out with a power spray in which fluid from a 400–500 gal. sump is sprayed over sheep held in a pen. Decomposition was more rapid in this case but was not sufficient to render the treatment ineffective provided the volume of liquid in circulation did not fall below 200 gal. With lesser quantities of liquid the polysulphide content declined rapidly, possibly due to increase of oxidation by the more rapid circulation through the sprays.

The lime-sulphur fluid was very irritant to shear cuts, and might induce secondary infection predisposing to fly strike.—N. P. H. GRAHAM.

MATTHYSSE, J. G. (1945.) **Large scale power dusting of feeder lambs for winter control of the sheep tick.** —*J. econ. Ent.* **38.** 285–290. **1177**

A method is described of power-dusting lambs for the control of sheep keds (*Melophagus ovinus*). The machine used is a modified 5-horsepower, 18-nozzle crop duster. Under experimental conditions, 1,400 lambs were treated in six hours. The most effective dust was a mixture of 1 part cubé root (4·8% rotenone), 10 parts pyrox ABB, with 2% of no. 10 motor oil, which gave a 90% kill of keds within two days with very little subsequent reinfestation. A dust containing 5% D.D.T. (neocid) was ineffective, the corresponding mortality being only 7% and the keds subsequently increasing to a higher level than that which occurred on any of the rotenone-dusted flocks.—J. B. CRAGG.

TAYLOR, E. L. (1945.) **Benzenehexachloride. A promising new acaricide.**—*Vet. Rec.* **57.** 210–211. **1178**

A 1% solution of benzene hexachloride (" 666 ") in liquid paraffin was found to be superior to either benzyl benzoate or tetraethylthiuram monosulphide as an acaricide in rats infested with *Notoëdres muris*. D.D.T. when used in the same way was comparatively ineffective. No evidence of skin irritation was observed with " 666 ".—W. MOORE.

*SCHAAF, J. Die Widerstandsfähigkeit freier Räudemilben gegen chemische Mittel. [**Resistance of mange mites to chemical agents** *in vitro*.]—*Ber. landw. Forsch. Pulawy.* **1.** No. 4. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 7th. 225–226. (1944).] **1179**

A series of substances is listed which have been tested against mange mites. Among the effective materials are 3–4% phenol, 2·5% creosote solution, 3% creolin, 3% durosept, petroleum ether and heavy benzenes.—J. B. CRAGG.

*SCHAAF, J. Ein einfaches Verfahren zur Feststellung der Schwefeldioxydkonzentration in Räudegaszellen. [**Determination of the sulphur dioxide concentration in the gas cell treatment of mange.**]—*Ber. landw. Forsch. Pulawy.* **1.** No. 4. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* July 21st. 239. (1944).] **1180**

Horses with mange can be treated in gas chambers containing sulphur dioxide at a concentration of 3–4·5%. Higher concentrations may cause poisoning. Control candles are useless for determination of SO_2 concentration since they may be extinguished at a concentration of 1%. The gas is best estimated by dissolving a quantity in an aspirator flask and titrating the solution against 0·1 N iodine solution.—J. B. CRAGG.

ORR, L. W., & MOTT, L. O. (1945.) **The effects of DDT administered orally to cows, horses, and sheep.** —*J. econ. Ent.* **38.** 428–432. **1181**

Four cows, two horses and four sheep were given daily doses for a week of 100 mg. D.D.T. per kg. body weight, as a dry powder or an aqueous suspension. During the second and third weeks the dosage varied from 100 mg. to 200 mg. daily. The results of these tests showed that D.D.T. is not acutely toxic at this dose level. Most of the material appeared to be eliminated from the body, although small quantities may have been taken up by the blood. At autopsy all the animals killed within three weeks of receiving D.D.T. showed numerous haemorrhages in the lining of the intestine, but in one sheep killed 67 days after receiving D.D.T. no haemorrhages were found.

In another test, single large doses of D.D.T., varying from 0·5–2 g. per kg. body weight, were given to sheep. Practically no clinical symptoms were observed except in the sheep receiving the largest dose, which showed evidence of paralysis, tremors and a slight diarrhoea 24 hours after treatment. On the second day she showed some improvement but trembling persisted and she refused food and water. These symptoms gradually disappeared and by the fourth day she began feeding and appeared normal. The ewe receiving 1·5 g. dropped a normal lamb about 40 hours after receiving D.D.T.; neither ewe nor lamb showed any obvious effects from the D.D.T.

Six caged pigeons were given a very large dose of D.D.T. in their regular feeding mash. Four of the birds died within a week while the other two continued to appear normal in spite of having eaten at least 10 g. D.D.T. each during the week.

It is pointed out that the effects should be determined of D.D.T. dissolved in oils or other organic solvents, as it is possible that such solutions may be more readily assimilated.—W. MOORE.

WARREN, D. C. (1945.) **The value of DDT for the control of the common chicken louse.**—*Poult. Sci.* **24.** 473–476. **1182**

Under experimental conditions sodium fluoride was as effective as a 10% D.D.T. dust in controlling chicken lice and was superior to a 3% D.D.T. dust. The D.D.T. did not protect the experimental bird from reinfestation after 2–3 weeks. When all birds of the flock were treated, 3% D.D.T. and sodium fluoride both gave effective control of lice.—W. MOORE.

HELLIER, F. F. (1945.) **Scabies and D.D.T.**—*Brit. med. J.* August 25th. 255. **1183**

The incidence of scabies amongst soldiers wearing shirts impregnated with D.D.T. or who had been using D.D.T. powder regularly for the preceding two months, was almost identical with that in a series who had not been treated. From these observations it is concluded that D.D.T. has no protective power against the acquirement of scabies.—W. MOORE.

ELMES, B. G. T. (1945.) **DDT treatment of mange (scabies) in rabbits.**—*Lancet.* **248.** 563. **1184**

Five rabbits with psoroptic mange and five with sarcoptic mange were treated by swabbing the infested areas with a 5% solution of D.D.T. in acetone and by dipping infested feet in the solution. At the end of two weeks all the psoroptic cases showed no parasites, but in two of the sarcoptic cases dead mites were found and the D.D.T. solution was re-applied. Four weeks after the initial treatment all the rabbits were clinically free

from disease. A single rabbit with sarcoptic mange was used as a control and treated with acetone only. At the end of the experiment this control animal was still infested.—W. MOORE.

BUXTON, P. A. (1945.) **The use of the new insecticide DDT in relation to the problems of tropical medicine.** —*Trans. R. Soc. trop. Med. Hyg.* **38.** 367–393. Discussion pp. 393–400. **1185**

A comprehensive review is given of the history of development, chemical properties, toxicity to mammals and general insecticidal characteristics of D.D.T., and its applications to insect control. In addition there is a valuable bibliography up to 1945. B. adds to this survey an account of his own extensive experiences with D.D.T. He points out that when properly used D.D.T. is a safe insecticide and that there are records of workers who have handled large quantities of the compound over a period of years without developing harmful symptoms of any sort.

The applications of D.D.T. against particular insects are manifold. A film of D.D.T. may be deposited on a wall and will kill flies and mosquitoes for several weeks. D.D.T. in mineral oil kills mosquito larvae; the volume of oil required is 5–10% of that required if the oil is used alone.

In the discussion following the paper other workers recounted their experiences with D.D.T., chiefly in relation to mosquito control. It was pointed out that D.D.T. has little value in mite infestations and that ticks require high doses by the methods of application which have been used up to the present time.—W. M.

—. (1945.) **Use of DDT for mosquito control in the United States.**—*Publ. Hlth Rep., Wash.* **60.** 469–470. **1186**

The Surgeons General of the U.S. Army and the U.S. Public Health Service point out that D.D.T. distributed over the countryside not only wipes out malaria-carrying mosquitoes but may also kill other insects, many of which are beneficial. Much must still be learned about the effect of D.D.T. on the balance of nature, which reacts on both agriculture and wild life, before general outdoor application of D.D.T. can be safely employed.

As a safeguard, the following joint policy has been agreed upon. Within the U.S.A., D.D.T. will be used for residual spray application to houses and other buildings for the purpose of killing adult mosquitoes before they have opportunity to transmit malaria. The use of D.D.T. as a mosquito larvicide will be limited to experimental investigations and to situations where D.D.T. has definite advantage over other larvicides in saving materials and manpower, and where it presents no hazard to fish and other wild life. Distribution of D.D.T. from aircraft for large-scale area control of mosquitoes in military and adjacent areas will be limited to projects conducted with due regard to the possible effect on beneficial insects and on all forms of plant and animal life, and in accordance with safeguards established by the health authorities.—W. MOORE.

ENZIE, F. D. (1945.) **Anthelmintic studies with some thymol-like compounds.**—*Proc. helminth. Soc. Wash.* **12.** 19–24. **1187**

A series of anthelmintic studies was carried out on dogs, using the following thymol compounds: 6-methyl-*m*-cresol, 4-isopropyl-*m*-cresol, 4-tertiary butyl-2-chlorophenol, 4-tertiary butyl-*m*-cresol, 4,6-di-tertiary butyl-*m*-cresol, 4-tertiary amyl phenol, and 2-amino-*p*-cymene. With only one of these, 6-isopropyl-*m*-cresol (isothymol), was promising anthelmintic activity accompanied by lack of toxicity. Doses of 0·4 and 0·5 g. per lb. body weight given after a fasting period of 18–24 hours were 100% effective against 109 ascarids in seven dogs. Doses of 0·3–0·5 g. per lb. body weight, however, removed only 6% of 895 hookworms in seven dogs. Multiple doses of 0·2–0·3 g. per lb. body weight did not increase the efficacy of the compound against hookworms. When given in dosage rates considerably higher than those of thymol the compound showed no evidence of toxicity in 11 dogs; these preliminary results indicate that the further testing of the compound against ascarids in dogs would be profitable.—T. E. GIBSON.

ENZIE, F. D. (1945.) **Methyl chloroform as an anthelmintic.**—*Proc. helminth. Soc. Wash.* **12.** 24–26. **1188**

Methyl chloroform was tested as an anthelmintic against ascarids, hookworms and whipworms in dogs. The drug was administered in hard gelatin capsules after a fast of 18–24 hours, and 3–4 hours after treatment the dogs were returned to regular normal feed. When elimination of the parasites ceased, the number of worms remaining in the dogs was ascertained by P.M. examination. When given at a dosage rate of 0·1–0·5 ml. per lb. body weight the compound removed all of 54 ascarids from five dogs, 90% (4,426) of 4,914 hookworms from ten dogs, and 14% (22) of 159 whipworms from seven dogs. At a dosage rate of 0·1 ml. per lb. body weight, the compound was 100% effective against ascarids, but at least 0·3 ml. per lb. is required for similar action against hookworms. There was no significant action against whipworms at dosage rates below 0·5 ml. per lb. body weight. When tested in chickens the drug failed to show any significant anthelmintic action.
—T. E. GIBSON.

MOSKALEV, B. S. (1940.) Opyty po izucheniyu mekhanizma deĭstviya mednovo kuporosa na Moniezia expansa. [**Mechanism of action of copper sulphate on** *Moniezia expansa.*]—*Rabot. XIII Plen. vet. Sekt. Akad. sel'khoz. Nauk, Moscow, 1939.* [*Collected Works.*] pp. 201–208. **1189**

By means of uncontrolled, simple biochemical experiments, it is shown that *M. expansa* is capable of anaerobic glycolysis and that this mechanism is inhibited by copper sulphate. Other Cu salts are equally effective and hence it is probably the Cu cation that exerts a toxic effect. Traces of arsenious oxide intensify this action.

It is concluded that any substance that interferes with the parasite's oxidation-reduction mechanism might be useful as a vermifuge.—L. LEVENBOOK.

GUTHRIE, J. E., & HARWOOD, P. D. (1943.) **Some practical results of using phenothiazine in the treatment of yearling wethers.**—*J. Tenn. Acad. Sci.* **18.** 355–358. **1190**

The authors report the results of phenothiazine medication as applied to 5,161 yearling wethers after purchase from Texas by the Evansville Producers' Commission Association of Indiana. These animals were divided into flocks and pastured in Indiana during the summer of 1942. Eleven of the flocks were dosed with phenothiazine shortly after their arrival in Indiana; 10 received no treatment, and five were treated only when mortality in these flocks reached alarming proportions. The doses used are not given, and in general the flocks were not supervised by the authors. Tables showing daily weight gains and daily profits, however, indicate that the treatment was profitable.—E. S.

THORP, W. T. S., HENNING, W. L., & SHIGLEY, J. F. (1944.) **The efficiency of the phenothiazine salt**

mixture and drench for sheep.—*J. Anim. Sci.* **3.** 242–249. **1191**

30 ewes and 50 lambs were used to test the efficacy as an anthelmintic for lambs of phenothiazine given as a drench or in a salt mixture. One group of ewes and lambs was kept on 1 : 9 phenothiazine-salt mixture and another group was given a drench of 12·5 g. phenothiazine in spring and autumn. Weekly faecal examinations and bi-weekly blood examinations were made and it was concluded that phenothiazine given by either of these methods was non-toxic. The 1 : 9 phenothiazine-salt mixture kept the egg counts of the ewes at a low level; the egg counts of the lambs were higher than those of the ewes, but none showed gross evidence of parasitism. It appeared that the lambs did not consume enough of the mixture to prevent the development of a mild parasitism. The group drenched in the spring and autumn were kept on pasture which had been free of sheep since the previous autumn. The egg counts of the ewes remained low but the counts of the lambs showed that the residual infection of the ewes might be sufficient to cause an infestation in the lambs if they received no treatment. Some of the lambs in this group showed gross evidence of parasitism. Two other groups of lambs were given, respectively, a drench of 12·5 g. phenothiazine at the beginning of the experiment followed by 1 : 9 phenothiazine-salt mixture for periods of a week at two-week intervals, and a 1 : 14 phenothiazine-salt mixture throughout the experimental period. No blood changes were noted in these groups, but the egg counts showed that these procedures were less satisfactory than the previous ones, some of the lambs showing gross evidence of parasitism. At the end of the experimental period the groups of untreated controls were in poor condition and showed severe symptoms of parasitism.

On the basis of these results and the findings of other workers, the authors make the following recommendations for the control of parasitism in sheep :– the whole flock should be drenched in the autumn; drenching should be repeated in spring 1–2 weeks after the ewes have lambed and then the entire flock should be placed on 1 : 9 phenothiazine-salt mixture; all lambs should be drenched when 3–4 months old. Ewes drenched in spring and kept on phenothiazine-salt mixture all the summer may not need to be drenched in autumn.—T. E. Gibson.

Kornberg, A., Endicott, K. M., Daft, F. S., & Sebrell, W. H. (1945.) **The influence of casein and other agents on the production of renal lesions in rats by sulfadiazine and acetylsulfadiazine.**—*Publ. Hlth Rep., Wash.* **60.** 661–675. **1192**

Severe renal lesions were produced regularly in rats as a result of feeding 1% sulphadiazine in a low (10%) casein diet. The development of these lesions was prevented by the addition to the diets of sodium bicarbonate, sodium chloride, casein or urea, even with restricted water intake; the blood sulphadiazine concentration was reduced by these agents, but the blood level does not seem to be the only factor involved in causing the lesions, as bicarbonate prevented injury even when 4% sulphadiazine was fed, producing high blood concentrations of the drug. A high renal concentration of conjugated sulphadiazine was always associated with severe lesions. Acetylsulphadiazine was more toxic than sulphadiazine.—E. Boyland.

Brunschwig, A., Nichols, S., Bigelow, R. R., & Miles, J. (1945.) **Sulfhydral protection of the liver.**—*Arch. Path.* **40.** 81–83. **1193**

Hepatic injury caused by administration of chloroform to dogs can be prevented by injection of sodium thioglycollate or methionine at the onset of the chloroform anaesthesia. Sodium thiosulphate or sodium glutamate had no protective action.—E. Boyland.

Schumacker, H. B., Jr., & Bethea, W. R., Jr. (1943.) **Some studies with zephiran, with particular reference to its use in time of war.**—*Surgery.* **14.** 931–945. [Abst. in *Bull. War Med.* **5.** 237, copied *verbatim.* Signed : L. P. Garrod.] **1194**

The authors, who are U.S. Army surgeons, strongly advocate the use of Zephiran for various purposes, notably for skin disinfection. They made a series of experiments in which sterile rubber gloves were put on after disinfection of the hands by various methods : one hour later, 10 c.c. of sterile saline were pipetted into the glove, worked about by opening and closing the fist, withdrawn again by pipette and cultivated. When the disinfection of the skin had consisted of three minutes' soaking in 1 in 2,500 or 1 in 1,000 Zephiran, the fluid withdrawn from the gloves was almost, or sometimes completely, sterile. That absence of growth in cultures made from it was not due to bacteriostatic action of disinfectant carried over was shown both by making cultures neutralized with soap, and by showing that fluid withdrawn from the glove, and cultivated after the addition of staphylococci to it, gave a profuse growth. Zephiran can also be used for disinfecting the patient's skin, and for treating superficial infections. An experiment, also with adequate controls, was done to show that it will sterilize instruments, but the authors prefer a solution containing formalin for this purpose. Zephiran is completely non-irritating, even if left in skin folds or introduced into the eye. Further advantages in war-time are its cheapness, its ready transportability in concentrated form, and the fact that its use as an alternative will replace and release large quantities of alcohol.

Hauser, E. D. W., & Cutter, W. W. (1944.) **Cationic detergents as antiseptics.**—*Amer. J. Surg.* **64.** 352–358. [Abst. in *Bull. War Med.* **5.** 237, copied *verbatim.* Signed : L. P. Garrod.] **1195**

This is a general account of the properties of cationic detergents, and in particular Zephiran, from the standpoint of their use as antiseptics. The authors also describe some simple experiments on skin disinfection by this compound, emphasize its freedom from any irritant effect, and recommend its use not only for preparing the surgeon's and the patient's skin, but also for the treatment of infected wounds.

Graydon, J. J., & Biggs, C. L. (1942.) **Some factors influencing bacterial survival in the presence of antiseptics.**—*Med. J. Aust.* Dec. 12th. 513–515. **1196**

This article outlines the special precautions necessary in making tests for viable organisms in the presence of mercurial antiseptics which inhibit bacterial growth in extremely high dilutions. The influence of previous exposure to antiseptics on the subsequent growth of bacteria and the importance of using copper-free media are discussed. The use of thioglycollic acid or sodium thioglycollate in the medium was found to be the most satisfactory means of overcoming the bacteriostatic action of these antiseptics. When sufficient thioglycollic acid is added to the medium, the resultant lowering of the oxidation potential enables anaerobic bacteria to grow with a considerably diminished latent period.
—N. Wickham.

See also absts. **1060** (treatment of piroplasmosis), **1065** (of foot and mouth disease), **1147, 1148** (toxicity of sulphonamides), **1149** (D.D.T. poisoning), **1098, 1101, 1144, 1150** (anthelmintics).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

SLOCOCK, S. L. (1945.) **A talk on the activities of the R.A.V.C. in British Occupied Germany.**—*Vet. Rec.* **57.** 543–544. Discussion pp. 544–545. **1197**

When the British Control Commission took over the British Zone in Germany the task of regenerating the German State Veterinary Service was allotted to the Royal Army Veterinary Corps.

The highly efficient German State Veterinary Service comes under the Veterinary Section of the Public Health Division of the Ministry of the Interior. This section supervised the education of veterinary surgeons, the control of animal diseases, slaughtering and abattoirs, meat inspection and the inspection of all other foods other than those of vegetable origin. Before appointment to the State Veterinary Service, a veterinary graduate had to have five years' experience in private practice and then pass a special State examination.

The total area of the British Zone is about 43,000 square miles and the task was to restore the service to its 1939 efficiency. There was no shortage of private practitioners; there was, in fact, an increase, owing to the influx of refugees from other areas.

The production of foot and mouth disease vaccine was the most pressing need owing to the fear of widespread outbreaks of this disease. This was being carried out within the British and other zones.

The Veterinary College of Hanover, although badly damaged, was to restart its educational facilities. Damage to all means of communication, as well as to buildings, hampered the restoration of all civilian government services.—J. A. GRIFFITHS.

—. (1945.) **American Veterinary Medical Association, Directory 1945.** pp. 147. Chicago, Ill.: The Association. 8vo. $2.00 to members and $5.00 to non-members. **1198**

This tenth edition includes new and useful features. In addition to listing all members of the A.V.M.A. both alphabetically and geographically (giving in all more than 8,500 names and addresses), it includes information on the official veterinary services in the U.S.A. and Canada, data on livestock populations, a digest of veterinary legislation, a list of veterinary schools, details of the organization of the Bureau of Animal Industry and a mass of other useful information.

The whole forms a work of reference which is invaluable to workers outside the U.S.A.—M. C.

IVANOVSKIĬ, V. A. (1943.) Veterinariya na sluzhbe zhivotnovodstva. **[Veterinary service and animal husbandry.]**—*Veterinariya, Moscow.* No. 7. pp. 1–3. **1199**

In spite of wartime difficulties, the essential veterinary services planned for 1942 and the first half of 1943 were accomplished according to schedule, although many local services remained unsatisfactory in some respects. The superintending veterinary officers were urged to improve the organization and provide adequate supplies of sera and vaccines.

Among the most important work to be undertaken during the summer of 1943 was the complete eradication of outbreaks of horse mange and sheep scab, swine erysipelas, swine fever, foot and mouth disease, blackleg and encephalomyelitis. More attention was to be paid to prophylactic measures against piroplasmosis and to the control of ticks and stress was to be laid on the care of young stock.—E. CHERKESI.

—. (1944.) Universidade de São Paulo. A Faculdade de Medicina Veterinaria e a profissão de veterinário. **[The Faculty of Veterinary Medicine, University of São Paulo, and the veterinary profession.]** pp. 14. São Paulo: Imprensa Oficial do Estado. 8vo. **1200**

This illustrated syllabus of the Veterinary Faculty, University of São Paulo, lists the names of the teaching staff of 16 professors and 17 lecturers. The course extends over four years and the subjects studied in each year are described. The faculty was founded in 1935 and the part played by its graduates in the development of the livestock industry is briefly reviewed.—M. C.

MEDRANO, S. W. (1944.) Reglamentación de la carrera médico-veterinaria en la municipalidad de la ciudad de Buenos Aires. **[An order concerning the veterinary profession in the city of Buenos Aires.]**—*Gac. vet., B. Aires.* **6.** 259–263. **1201**

This order sets forth the constitution of the Veterinary Service of the City of Buenos Aires. The professional cadre is composed of second and first class veterinary inspectors, sanitary officers, section chiefs and a Sub-Director. The system of admission to each grade is defined and is by examination; scientific work done is also taken into account. Details are given concerning the recruitment of lay assistants and of the grading of appointments.—I. W. BROCKLEHURST.

See also absts. **1023-1025** (TB. control), **1037** (salmonella strains in Palestine), **1063** (foot and mouth disease in man), **1186** (control of D.D.T. usage), **1212** (veterinary reconstruction in the U.S.S.R.).

TECHNIQUE AND APPARATUS

BAIER, W. E., & MANCHESTER, T. C. (1943.) **Research finds substitute for bacteriological agar.**—*Food Industr.* **15.** 94. [Abst. in *Bull. Hyg., Lond.* **20.** 40, copied *verbatim.*] **1202**

The authors have used a commercially prepared sodium pectate, containing about 1 per cent. ammonia as sodium ammonium pectate, as a substitute for agar in bacteriological media. Formulae and methods of preparation are given of four media which have proved satisfactory. It was necessary to use about twice as much pectate as agar; the amount of pectate required may be reduced by increasing the amount of available calcium. The media containing pectate set more slowly than those containing agar; limited data available indicate that plate counts on pectate media may be made after a somewhat shorter period of incubation than with agar plates. Gels so far produced using pectate show the required reversibility to heat over only a small range of pH values, but pH value 6·5, at which most organisms found in milk, water, and sewage thrive, comes within this range. Setting of the pectate gels is affected by the presence of calcium and magnesium. Some moulds and a few bacteria liquefy the pectate media; growth of moulds can be controlled by incorporation of sodium propionate or diphenyl in the media or by placing crystals of diphenyl so that the vapour is present at the surface of the media.

DEVIGNAT, R. (1944.) **Aeration of fluid culture media. Supplementary observations.**—*Edinb. med. J.* **51.** 124–130. **1203**

When air is washed with caustic potash before being bubbled through a bacterial culture it exerts an attenuating influence on the toxic and pathogenic activities of aerobic organisms. Hydrogen, similarly treated, exerts a similar influence on anaerobic organisms. D. is of

the opinion that these effects are related to the radioactivity (beta emanation) of potassium. This view is supported by the observations of numerous workers on the attenuating action of radium (beta) emanation, and by D.'s observation that when potassium is replaced by calcium (non-radioactive) or uranium (mainly alpha emanation), no attenuation results.

By this technique avirulent strains of *Pasteurella pestis*, greatly attenuated strains of *Bacterium shigae* and *Salmonella typhi* and a non-toxic strain of *Clostridium tetani* have been obtained.—H. S. McTaggart.

Levinson, S. O., Milzer, A., Shaughnessy, H. J., Neal, J. L., & Oppenheimer, F. (1945.) **A new method for the production of potent inactivated vaccines with ultraviolet irradiation. II. Sterilization of bacteria and immunization with rabies and St. Louis encephalitis vaccines.**—*J. Immunol.* **50.** 317–329. [Publication of Part I withheld by the Committee on Medical Research of the Office of Scientific Research and Development, U.S.A.] **1204**

Milzer, A., Oppenheimer, F., & Levinson, S. O. (1945.) **A new method for the production of potent inactivated vaccines with ultraviolet irradiation. III. A completely inactivated poliomyelitis vaccine with the Lansing strain in mice.**—*Ibid.* 331–340. **1205**

II. A new technique of inactivation killed suspensions containing approximately 1,000 million organisms per ml. of the following bacteria by exposure for 0·17–0·33 sec. in a continuously flowing thin film to extreme ultraviolet rays (below 2,000 Ångstrom units): *Bacterium coli*, *Salmonella typhi*, *S. enteritidis*, *Staphylococcus aureus*, *Streptococcus viridans* and *Streptococcus pneumoniae* (Type I). 4% brain tissue suspensions infected with fixed rabies, lymphocytic choriomeningitis and St. Louis encephalitis viruses were inactivated by exposure for 0·8–0·66 sec. Rabies virus inactivated thus, produced a higher degree of immunity when used as a vaccine in mice than did phenolized vaccines. Irradiated vaccine showed no loss of potency after six months' storage at 5°C. St. Louis encephalitis vaccine inactivated by irradiation conferred a high degree of immunity in mice. Irradiation of rabies or St. Louis encephalitis viruses beyond the optimal time necessary for complete inactivation caused progressive loss of antigenicity. The conditions of inactivation can be standardized so that experiments can be repeated with consistent results. [Publication of details of the technique and apparatus is withheld, in the meantime, by the U.S. Office of Scientific Research and Development.]

III. 4% mouse brain and spinal cord tissue suspensions infected with the Lansing strain of poliomyelitis virus were inactivated by irradiation for 0·5–0·66 sec. Mice receiving intra-abdominally up to three 0·5 ml. doses of the inactivated suspension developed a significant degree of resistance to intracerebral inoculation of virus. Neutralizing antibodies were detected one week after a single dose of vaccine. The vaccine showed no loss of potency after four and a half months' storage at 3°C.—W. M. Henderson.

Culpepper, G. H. (1944.) **The rearing and maintenance of a laboratory colony of the body louse.**—*Amer. J. trop. Med.* **24.** 327–329. **1206**

Approximately 100 adult lice are placed on a piece of loosely woven woollen suiting cut approximately 1½ in. square; about 50 such infested patches are carefully placed so that they will cover a piece of ½-in. mesh "hardware cloth" (woven wire) cut to fit the bottom of a crystallizing dish 8 in. in diameter, and the whole is then kept at a temperature of 86°–90°F. and relative humidity of about 75%. Separation of the colony into lots according to age is accomplished by removing the adults from egg patches every 48 hours. Each batch of eggs is placed in a beaker on which the date is recorded, so that date of hatching may be anticipated. After hatching, nymphs remain on the same cloth patches until they become adults, when they are transferred to clean patches. Colonies are fed at 12-hour intervals by placing the cloth patches on the skin of a host animal. Feeding is rapid, and the whole operation occupies only 30–45 min.—G. B. S. Heath.

Franks, M. B., & Stoll, N. R. (1945.) **The isolation of microfilariae from blood for use as antigen.**—*J. Parasit.* **31.** 158–162. **1207**

The authors obtained a fluid extract from the larvae of *Dirofilaria immitis* which gave positive precipitin tests with the serum of 20 infected dogs and eight human beings known to have filariasis. Control tests with normal sera were negative. Their method of obtaining the extract consisted in the haemolysis by saponin of the erythrocyte layer of centrifuged, citrated, infected blood, very careful washing of the microfilariae from the red cell stroma, lyophilization [freeze-drying] of the living microfilariae suspended in distilled water, grinding of the dried larvae and extraction in physiological saline. The supernate after centrifugation was used as the "antigen".—J. F. A. Sprent.

Rogers, K. B. (1946.) **Concentrating malaria parasites in thin films.**—*Brit. med. J.* Jan. 5th. 11–12. **1208**

Diagnosis of malarial infection has often to be made from faulty smears. The author's technique was evolved to secure the advantages of concentration and of seeing intracellular parasites. Any blood may be used but if the blood has clotted many of the white cells and all the platelets are avoided. When clotted blood is used it is shaken and the serum drawn off and centrifuged in a small tube; the serum, with the exception of a volume equal to that of the packed red blood cells, is discarded. The residual serum and the r.b.c.'s are mixed and run into a capillary tube which is sealed and centrifuged at 200–300 r.p.m. for half an hour. The capillary is then scratched at a level of about ½ in. above the top of the packed r.b.c.'s and is held horizontal and broken at this point. A second scratch is made ½ in. below the top of the red cell layer, the tube is again held horizontal and is broken at this second scratch. A Pasteur pipette, bent into an S shape is drawn out and sealed. The short piece of capillary tube is dropped into the pipette with serum uppermost and is spun for 2–5 sec., so that the blood goes to the capillary end of the pipette. The thin tip of the pipette is then cut off and by means of a rubber teat applied to the butt of the pipette the blood is blown out on to a slide and a thin smear is made. The edges of the film are examined for parasites. The degree of concentration has been estimated by counting the number of parasites seen under the oil-immersion objective in an equal number of fields in both plain and in concentrated films. The average degree of concentration in 22 positive bloods has been 15·8 times, made up of 426 parasites in the plain, as against 6,718 in the concentrated films.—C. Horton Smith.

Singh, J., & Bhattacharji, L. M. (1944.) **Rapid staining of malarial parasites by a water soluble stain.**—*Indian med. Gaz.* **79.** 102–104. **1209**

A polychrome methylene-blue stain is described, which consists of cheap and readily obtainable ingredients and which it is stated can easily be prepared in the laboratory. The stain is prepared from medicinal methylene blue in an aqueous solution, and the use of imported azures, glycerin and methyl alcohol is thus avoided. Staining results are stated to be comparable with those of any other Romanowsky stain.—M. A. K.

Lillie, R. D. (1944.) **Factors influencing the Roman-**

ovsky staining of blood films and the role of methylene violet.—*J. Lab. clin. Med.* **29.** 1181–1197. **1210**

The constitution of the azure component of Wright's stain is difficult to control when the usual process of steaming one hour with $NaHCO_3$ is used. Alkali polychroming methods are difficult to control but acid polychroming with 200 mg. $K_2Cr_2O_7$ (or the Na equivalent) per g. of 86% medicinal methylene blue yields chiefly azure B with some methylene blue which is excellent for blood protozoa and blood cells (10% less $K_2Cr_2O_7$ is needed when commercial methylene blue containing zinc chloride is used, since this is only 80·5% methylene blue). Its eosinate is more stable in methanol solution than eosinates with higher proportions of azure A. A 1 : 24 dilution of a 1% solution of such an eosinate in equal volumes of glycerol and methanol is excellent for blood staining. The glycerol-methanol solution is much more stable than ordinary methanol solutions and can be kept as a stock solution for dilution with methanol to 150 or 200 mg. per 100 ml. for the usual "on slide" Wright staining method.

—C. HORTON SMITH.

STEINER, G., & STEINER, Gr. (1944.) **New simple silver stain for demonstration of bacteria, spirochaetes, and fungi in sections from paraffin-embedded tissue blocks.**—*J. Lab. clin. Med.* **29.** 868–871. **1211**

After removal of the paraffin, sections are placed in 1% aqueous uranium nitrate solution for 3 min., washed twice with distilled water, immersed in 1% aqueous silver nitrate for two hours at 56°–58°C., washed thoroughly, dehydrated up to absolute alcohol, placed in 2·5% gum mastic in absolute alcohol for 5 min., transferred without washing to a reducing mixture for 12–15 min. until they become light brown, washed, dehydrated, cleared and mounted in balsam.

The reduction mixture is prepared by dissolving 2 g. silver nitrate in 1,000 ml. boiling distilled water. 1·65 g. powdered sodium potassium tartrate are then added quickly. The precipitate is removed by filtering while still hot. Before use, one part of this solution is poured into one part of 2·5% alcoholic gum mastic solution (not *vice versa*). The resultant milky fluid added to three parts of a 1 : 60 solution of hydroquinone in twice-distilled water constitutes the reduction mixture. The hydroquinone solution must be prepared freshly each time, but the other reagents will keep indefinitely in glass-stoppered amber bottles in the refrigerator.

The method is not suitable for Zenker-fixed tissues or for celloidin films. Bacteria, spirochaetes and fungi stain with a black shiny metallic coat and show a very deep colour contrast against the yellow or brown tissue elements. Protozoa do not show this contrast.

—H. SCOTT MCTAGGART.

See also absts. **1012** (coagulase test for staphylococci), **1013** (cultivation of staphylococci), **1015** (test for Group B streptococci), **1039**, **1040** (brucella ring test), **1069**, **1072** (cultivation of influenza virus), **1129** (blood pressure determination in horses), **1133** (iron estimation), **1177** (power dusting of lambs with insecticides), **1221** (manual of veterinary clinical pathology), **1223** (measurement of colour).

MISCELLANEOUS

ANON. (1943.) O neotlozhnykh merakh po vosstanovleniyu khozyaĭstva v raĭonakh, osvobozhdennykh ot nemetskoĭ okkupatsii. **[Urgent measures on reconstruction of farms liberated from German occupation.]** —*Veterinariya, Moscow.* No. 8–9. pp. 1–22. **1212**

The joint resolutions of the Soviet of People's Commissars and the Central Committee of the Communist Party on urgent measures for the rehabilitation of farming in liberated regions comprise administrative instructions to Government departments, provincial, regional and district executive committees and other official bodies. They are grouped under ten headings, six of which directly concern agriculture, and include the return of stock evacuated to eastern regions, the increase of stock on collective farms, the restoration of poultry farms, rebates on farm produce deliveries, seed subsidies and railway allotments.

In the instructions on the return of stock evacuated to eastern regions, precise figures are given of the stock to be transferred from each of the eastern to each of the liberated provinces and of the men, materials and foodstuffs to be released for this purpose. The procedure to be followed in each case is outlined. Provision is made for the release of 50 veterinary surgeons and 100 veterinary assistants from the Red Army Reserves to supervise the transfer of stock. Eleven and a half million roubles are set aside towards the costs of the operation. Five to seven veterinary schools are planned for each of the liberated provinces, each school to train 100–150 students, with periods of training lasting 3–12 months. Scholarships of 100–150 roubles per month will be made available to junior veterinary assistants and technicians.

To increase stock on collective farms, the Ministry of Agriculture is empowered to buy up all available in the Eastern and Central Provinces. Local executive committees may increase their purchases of stock from collective farms, collective farmers and from individual workers and employees. Collective farmers who supply lambs for liberated regions are exempt from compulsory meat deliveries to the State. All young bulls are to be kept for stock-breeding purposes.

The resolutions provide for all poultry farms which existed in liberated regions before the war to be restored and fully restocked before the 1st January, 1944. Half a million pedigree fowls will be imported for this purpose into the liberated regions and, in addition, the Ministry of Agriculture will release 9·6 million chicks from its incubating stations. Fifty-five incubating stations will also be re-established in liberated regions; during 1943–44 the manufacturing industry is to supply them with 200 incubators to hold 3–30 thousand eggs each and the Ministry of Agriculture is to supply 16 million eggs. Provision is made for the training of 580 poultry-keepers and for the direction of 130 poultry specialists from technical schools to liberated regions.

Categories are specified of collective farms and of workers and employees whose families are wholly or partially exempt from farm produce deliveries to the State.

Railwaymen and railway employees may take up along railway lines allotments not exceeding 0·15 hectares, including area under buildings, and pasture ground not exceeding 1 hectare per family. The holder of an allotment will be exempt from farm produce deliveries to the State and from farm taxes. A housing subsidy of 10,000 roubles for seven years per family for private building is also made available to railwaymen up to a total of 10 million roubles.—E. CHERKESI.

DICKEY, E. S. (1944.) **Report of a cattle degrubbing test in connection with cattle belonging to John Morrell & Company.**—*Iowa Vet.* **15.** No. 4. 8 & 31. **1213**

A group of 50 cattle treated for warbles two months before the larvae were due to leave their hosts, made a

greater live-weight increase during the two months after treatment than an untreated control group. However, there was a great difference between the initial weights of the groups, and during the third month immediately after the larvae had emerged, when for various reasons all the animals lost some weight, the treated group lost more weight than did the controls. At the end of the third month when the cattle were slaughtered, there was no significant difference between the groups.—W. MOORE.

KRISHNASWAMY, A. (1944.) **A study on the principles of genetics with regard to parental disposition and the possible potentialities of progenital inheritance.** —*Indian vet. J.* **21.** 80–87. **1214**

A general discussion of sex-determination with references to old Indian writings.—D. P. MUKHERJI.

REPORTS

UNION OF SOUTH AFRICA, JOHANNESBURG. (1944.) **Report of Director of Abattoir and Livestock Market Department for the period 1st July, 1943, to 30th June, 1944.** [KIRKPATRICK, A. C.] pp. 9. Johannesburg: Radford, Adlington, Ltd. fcp. **1215**

The open market and the quarantine market between them handled a total of 1,596,140 head of livestock during the year ended June 1944. In 1943, 202,080 cattle, 712,549 sheep and 194,105 pigs were slaughtered. 132 cases of TB. were reported in cattle and 462 in pigs. Two cases of anthrax occurred. Details of organs and carcasses condemned at the slaughterhouses are tabulated. In all, approximately 1,133 tons of meat were condemned. 10,309 cows in 218 dairies were inspected and five cases of open TB. were diagnosed.—M. C.

BRITISH GUIANA. (1944.) **Report of the Department of Agriculture for the year 1943.** pp. 12. Items of veterinary interest p.10. Demerara: The Argosy Company, Ltd. fcp. **1216**

Brief mention is made of livestock diseases. Severe mortality occurred in poorly developed areas as a result of heavy rainfall. Two cows in a dairy died from anthrax. Six cases of anaplasmosis were treated. A veterinary officer was appointed for the Rupununi district and started work in October. Sickness is horses [no details given] is being investigated.—M. C.

BRITISH HONDURAS. (Undated.) **Annual report of the Department of Agriculture, 1943.** Unpaged. Items of veterinary interest Section I, para. 16(b). **1217**

A very short section on livestock is included. In 1943 there were 10,131 cattle, 9,555 pigs, 3,688 horses and mules, 363 goats and sheep and 44,410 poultry. Ticks and blood-sucking flies continue to cause damage to livestock and are controlled by spraying on the larger farms; dipping has not yet been adopted. Intestinal worm parasites are common, especially in pigs. Cattle died from an unknown disease which has been recurring in the Cayo area for some years. From the symptoms it is thought the disease may be rabies transmitted by blood-sucking bats (*Desmodus* sp.).—M. C.

—. (Undated.) Rapport sur le fonctionnement de l'Institut Pasteur du Maroc, Année 1943. **[Morocco: Report of the Pasteur Institute for the year 1943.]** pp. 74. Items of veterinary interest pp. 5–14, 15 & 21–47. **1218**

The first section of the report deals with the research work carried out during 1943. Work on murine typhus showed that a strain of the causal organism was fully virulent after 569 passages through g. pigs between January 1933 and December 1943. Dried virus kept in evacuated ampoules for 2,268 days was also fully virulent. The baboon louse, *Pedicinus albus*, was shown to be capable of transmitting typhus and the rat flea, *Xenopsylla cheopis*, was found capable of becoming infected with certain salmonella organisms and of transmitting them from host to host. *Salmonella cholerae-suis* and *S. shottmülleri* have both been transmitted in this way. Canine visceral leishmaniasis has been transmitted to the squirrel *Xerus getulus* and a case of mycosis has been reported in this species.

A detailed account is given of the methods used in the preparation of sera for therapeutic purposes, detailing the selection and management of the horses, the technique of injection, general and local reactions observed in the serum-producing animals and the technique of bleeding. The preparation of gangrene antiserum, diphtheria antiserum and tetanus antiserum is treated in detail. There is also an account of the methods of preparation of the following therapeutic products from milk: lactic ferments, yoghourt and buttermilk.

A list of papers published during the year is given. Statistics of various routine services, *viz*, antirabies service, vaccination service, typhus control service, the production of biological products and laboratory examinations are also appended.—T. E. GIBSON.

See also abstr. **1198** (American Veterinary Medical Association, Directory 1945).

BOOK REVIEWS

GROSSMAN, J. D. [G.Ph., D.V.M.] (1944.) **Dissection guide for veterinary anatomy.** pp. 52. 8 figs. Ann Arbor, Mich.: Edwards Brothers, Inc. 4th Edit. 8vo. **1219**

Sisson's "The anatomy of the domestic animals" has long been recognized as a leading textbook, but it is often criticised in that, although excellent for reference, it is of limited value as a dissection manual and does not encourage the reader to think for himself. In this guide, for use in the dissection of the horse, GROSSMAN, who revised the 1938 edition of Sisson's work, remedies much of this deficiency. The guide is designed for use with the textbook, to the page numbers and figures in which the numbers in the notes refer.

The introduction rightly stresses that both before commencing and during the course of dissection the student should study the living subject by palpation and observation of the common integument. This advice, together with the constant references to the skeletal structure and the questions put to the reader will stimulate a sense of reasoning leading to a true appreciation of the value of the subject.

The order of dissection of the parts is open to criticism, but no doubt it has proved satisfactory, since the guide was assembled from dissecting room records. It is feared that the student must turn several pages to find the script corresponding to his dissection but this is inevitable in referring to a book written in the systematic style. It is to be hoped that G. will prepare similar dissection guides for use with the other animals dealt with in the textbook.—C. W. OTTAWAY.

BRAGA, A. [Diretor da Escola Fluminehse de Medicina Veterinaria—Diretor de Divisão no Instituto Vital

Brazil—Ex-Assistente-Chefe do Instituto de Biologia Animal (Ministério da Agricultura).] (1943.) Soros, vacinas, alérgenos e imunígenos. Tomo IV. [**Sera, vaccines, allergens, and immunogens. Vol. IV.**] pp. 544. Numerous plates, figs., tables & refs. Brazil, Rio de Janeiro: Serviço de Informação Agricola, Ministério da Agricultura. 8vo. [For volume III, see *V. B.* **13.** 308.] **1220**

This book begins with a useful general account of the production of sera, including the choice and care of animals, the technique of hyperimmunization and bleeding, and the collection, filtration and preservation of sera. The preparation and titration of haemolytic serum for the complement-fixation test, and swine plague and swine erysipelas antisera are discussed in detail.

In the chapter on the use of convalescent blood, serum and plasma, B. deals with collection and preservation, indications for use, methods of transfusion and attendant dangers, such as transfer of infectious diseases, haemagglutination and serum sickness. A little more information on the subject of blood grouping in the animals, particularly in the equine, would have rendered this chapter more valuable.

There are exhaustive discussions on the preparation and assay of the various anthrax, blackleg, rabies, fowl pox and avian spirochaetal vaccines. Further chapters are devoted to the antigen for rapid pullorum disease testing and to Ramon's flocculation test.

The final chapter reviews briefly the position with regard to the standardization of veterinary biological products in most countries of the world. From a study of the details given, it becomes obvious that international standardization of these products is both desirable and essential.

This volume contains the index for all four books of the series.—I. W. BROCKLEHURST.

COFFIN, D. L. [V.M.D., School of Veterinary Medicine, University of Pennsylvania.] (1945.) **Manual of veterinary clinical pathology.** pp. viii+263. 66 figs. Numerous refs. Ithaca, N.Y.: Comstock Publishing Company, Inc. 8vo. Revised Edit. **$4.00.** **1221**

In this volume C. describes the laboratory procedures which may be of assistance in the diagnosis of the diseases of the domestic animals. A short chapter on the use of the microscope is followed by one on the collection of material for examination and the packing of specimens for despatch to the laboratory. The third chapter describes the laboratory methods used in the diagnosis of parasitic diseases and includes charts to assist in the recognition of the various parasitic bodies found in the faeces. The next chapter covers the physical, chemical and microscopical aspects of urine examination, interpretation of the findings being dealt with separately. There are two chapters on haematology, the first dealing with methods and the second with interpretation of the findings. Following this is a chapter on the diagnosis of bacterial diseases with extensive tables which should be of assistance in the identification of specific organisms and conditions. There is a short chapter on mycotic diseases and one on protozoan blood diseases. Virus diseases and the examination of poultry are dealt with briefly and there is a useful chapter on semen examinations and pregnancy tests. The final chapter gives the formulae of the stains and other special reagents used in the diagnosis laboratory.

The book should prove useful to practitioners and others as an indication of the scope and limitations of the laboratory procedures which they may themselves perform or which may be carried out on their behalf by a specialist diagnosis laboratory.—T. E. GIBSON.

THOMAS, J. F. H., *et al.* (1945.) **Sheep.** pp. 196. London: Faber & Faber Ltd. 8vo. 15s. **1222**

More mutton per head is eaten by the population of Great Britain than by any other population in the Northern Hemisphere. Most of the land lying at an elevation of 1,000–3,000 feet above sea level, constituting more than one-quarter of the total area of the country, is suitable only for sheep grazing. In the management of light arable land, sheep play an important part. Despite these facts, the sheep population of Great Britain has fallen during the past two decades; this tendency must soon be corrected or agriculture may suffer severely. It is especially important that export trade in breeding stock should be maintained.

The authors suggest a target figure for a sheep population of six million more in 1949 than there were in 1939 and consider that, among other things, achievement of this figure will involve improvement of hill land, encouragement of the breeding of hill sheep for the lowlands, enlargement and co-ordination of research programmes on sheep diseases and improvement of living conditions for shepherds.

Good breed descriptions, aided by a wealth of excellent photographs, should make the book a standard work of reference to students of zootechny. Systems of sheep husbandry are described under the headings "Sheep on English lowland farms", "Mountain and hill sheep farming in Scotland", "Sheep farming in the Scottish Border Counties", and "Sheep farming in Wales". A classification of carcass types, with hints on production of wool and mutton is included and a list of breed societies is contained in an appendix.

It is perhaps unfortunate that a chapter on hygiene and diseases was attempted. This chapter contains many obvious and elementary mistakes and might well be omitted from any future edition, as it constitutes a weak point in an otherwise well informed monograph. —G. B. S. HEATH.

WRIGHT, W. D. [A.R.C.S., D.Sc., Technical Optics Section, Imperial College of Science and Technology.] (1944.) **The measurement of colour.** pp. vii+223. 65 figs., numerous tables. London: Adam Hilger Ltd. 8vo. 30s. **1223**

The measurement of colour has become of great importance in many scientific fields, particularly in analysis depending upon colorimetry. DR. WRIGHT who is an expert in the subject describes the fundamental nature of instruments and processes with the help of diagrams many of which are in colour. Rapid advances are being made in the understanding of colour vision and the present book deals with colour vision and the effects caused by change of light intensity due to change in the relative importance of rods and cones in the retina. All colours should be definable in terms of three variables representing the three primary colours and DR. WRIGHT deals with systems of colour specification and with the underlying principles, design and use of trichromatic colorimeters.

Other chapters discuss the spectrophotometric measurement of colour and the construction and use of a colour atlas. Finally the applications of colorimetry to lighting, agriculture (particularly with regard to cotton and soils), chemical analysis, the paper industry, the paint industry, signal glasses and meteorology are considered. Although the book is an authoritative manual the price seems high for a book of little over 200 pages.—E. BOYLAND.

See also abst. **1193** (American Veterinary Medical Association Directory).

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